

MOTOR AGE

Pick of the Speed Flock at Savannah



SAVANNAH, GA., Nov. 18—Over Savannah's famous course there will be run Thanksgiving week the four premier road racing events of the fall. There are now assembling in the southern city the greatest aggregation of racing cars and drivers ever gotten together in this country. The importance of annual events at Savannah has been increased this year by the addition of the Vanderbilt race, making Georgia for Thanksgiving week the mecca for motoring enthusiasts of the world. Preparations are now complete for the conduct of the great national and international races. Forty-four cars have been entered to date in the four events.

An Eleventh Hour Change

One of the eleventh hour changes in the running card was the decision of the Savannah Automobile Club, after conference with the officials of the Automobile Club of America and the American Automobile Association, under the auspices of which the grand prize and Vanderbilt races are conducted, to run the Vanderbilt races separately from the light-car races, but on the same day, leaving the second racing day free for the grand prize race. Pursuant to this decision the small cars will be sent away at daybreak on Monday, the two races being run together, the start of the Vanderbilt to be postponed until the finish.

This will eliminate any possibility of interference with the running of the Vanderbilt. The cars in this race will be started approximately at 10:30 a. m., which will allow ample time for people coming out to see the races to witness the finishing laps of the light cars prior to the get-away of the Vanderbilt entries. It also is calculated that the Vanderbilt cars will be enabled under this arrangement to make faster time, it having been deter-



mined that the presence on the track of the small cars might act against the maintenance of maximum speed on the part of the Vanderbilt racers. The possibility of accidents on the course also will be materially lessened thereby.

Grand Prix on Thanksgiving

There will be an interval of 2 days between the light-car and Vanderbilt races and the running of the grand prize, which latter will be staged alone on Thanksgiving day. Fourteen cars have been entered in this event, foreign and domestic.

The course will be thrown open for official practice on Monday. All of the teams have established their racing camps, and a number of them have had their cars on the course. The course will be guarded

THE MOTORING
HOUR GLASS



SAVANNAH CHALLENGE CUP

by flagmen during the hours set apart for practice, and every safeguard taken to prevent accidents. The time for closing the entry lists has been extended to November 23. It is possible there will be additional entries beyond those already announced.

The races will be guarded by the military this year, as formerly. The governor has ordered out all the Savannah companies of the National Guard of Georgia for the purpose. The policing of the course by the military has added greatly to the success of all previous races.

Soldiers Guard the Course

In fact, the securing of the Vanderbilt race for Savannah was contingent upon the course being guarded by soldiery. Immediately following the disastrous running of the last Vanderbilt race on the Long Island course, the Motor Cups Holding Co. announced that the race would not be run again except on a course patrolled similarly to the circuit at Savannah. The Savannah Automobile Club immediately made application for the race to be run in the Chatham county roads in conjunction with the grand prize and light-car races. All of the grand prize races have been run on the Savannah course.

ENTRIES FOR THE FOUR RACES AT SAVANNAH

TIEDEMAN TROPHY, 170 MILES, CLASS 161-230

Car	Bore	Stroke	Piston Disp.	Entrant	Driver
Abbott-Detroit	4 1/4	4 1/4	227	Abbott Motor Co.	H. L. Hartman
Abbott-Detroit	4 1/4	4 1/4	227	Abbott Motor Co.	Mortimer Roberts
E-M-F-Flanders	...	...	...	Studebaker Corp.	Robert Evans
E-M-F-Flanders	...	...	...	Studebaker Corp.	Frank Witt
E-M-F-Flanders	...	...	...	Studebaker Corp.	Jack Tower
Ford	...	...	...
Ford	...	...	...
Ford	...	...	...

SAVANNAH CHALLENGE TROPHY, 221 MILES, CLASS 231-300

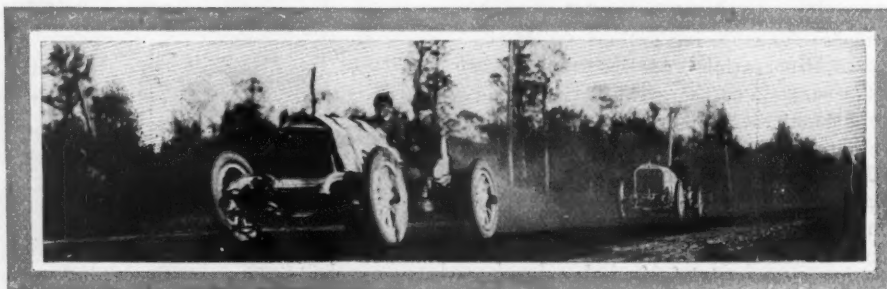
Case	4 3/4	5	300	J. I. Case Threshing Machine Co.	
Case	4 3/4	5	300	J. I. Case Threshing Machine Co.	L. Disbrow
Mercer	4 3/4	5	300	Mercer Auto Co.	Hugh Hughes
Mercer	4 3/4	5	300	Mercer Auto Co.	W. F. Barnes, Jr.
Mercer	4 3/4	5	300	Mercer Auto Co.	Billy Knipper
Marmon	4 23-64	5	299	Nordyke & Marmon Co.	Joe Nikrent
Marmon	4 23-64	5	299	Nordyke & Marmon Co.	Cyrus Patschke
Ohio	...	...	...	Ohio Motor Co.	

VANDERBILT CUP, 289 MILES

Abbott-Detroit	4 1/2	5 1/2	349	Abbott Motor Co.	L. A. Mitchell
Abbott-Detroit	4 1/2	5 1/2	349	Abbott Motor Co.	Carl A. Limberg
Jackson	5	5 1/2	431	Jackson Auto Co.	Harry H. Cobe
Fiat	5	7.48	596	Fiat Automobile Co.	E. H. Parker
Fiat	5	7.48	596	Fiat Automobile Co.	D. Bruce-Brown
Fiat	5	7.48	596	Fiat Automobile Co.	Joe Matson
Lozier	5 3/4	6	544	Lozier Motor Co.	Ralph Mulford
Lozier	5 3/4	6	544	Lozier Motor Co.	Harry Grant
Mercedes	5.1	7.1	583	Spencer E. Wishart	Spencer Wishart
Mercer	4.36	5	448.5	Mercer Auto Co.	Hugh Hughes
Marmon	4 3/4	7	496	Nordyke & Marmon Co.	Joe Dawson
Marmon	4 3/4	7	496	Nordyke & Marmon Co.	Cyrus Patschke
Mercedes	5.1	7.1	583	Ralph De Palma	Ralph De Palma
Pope-Hartford	...	...	...	W. J. Murray	L. A. Disbrow

GRAND PRIZE, 408 MILES

Fiat	5.9	7.87	858	Fiat Automobile Co.	David Bruce-Brown
Fiat	5.9	7.87	858	Fiat Automobile Co.	Caleb S. Bragg
Fiat	5.9	7.87	858	Fiat Automobile Co.	Louis Wagner
Benz	6.1	7.87	920	Benz Auto Import Co.	Victor Hemery
Benz	6.1	7.87	920	Benz Auto Import Co.	Erwin Bergdoll
Benz	6.1	7.87	920	Benz Auto Import Co.	Eddie Hearne
Lozier	5 3/4	6	546.6	Lozier Motor Co.	Ralph Mulford
Abbott-Detroit	4 1/2	5 1/2	349.9	Abbott Motor Co.	L. A. Mitchell
Abbott-Detroit	4 1/2	5 1/2	349.9	Abbott Motor Co.	Carl A. Limberg
Marmon	4 3/4	7	486	Nordyke & Marmon Co.	Cyrus Patschke
Marmon	4 3/4	7	486	Nordyke & Marmon Co.	Joe Dawson
Pope-Hartford	...	...	...	W. J. Murray	L. A. Disbrow
Buick	...	...	...	G. H. Murphy	Harry Cobe
Buick	...	...	...	G. H. Murphy	Charles Basie



CASE STARTS SPRINT IN BACKSTRETCH



NEW CUT ON MONTGOMERY ROAD MADE TO AVOID CURVE

With nearly a year in which to prepare for the events the roads have been made as nearly perfect as it was possible to prepare them. A very heavy grade of oil was used, which has solidified the surface of the road until it is almost as hard as asphalt. A layer of sand was placed on top of the oil to hold it on the road bed until the binding process had been completed. All of the drivers have pronounced the course in most excellent shape.

The oil was put on by the Indian Refining Co., but the roads were built by convict labor. The Chatham county convict force has been at work on the course for several months. The oil wagons have followed close behind the road makers in order that the course might be completed as early as possible. As fast as a section of the road was oiled and sanded the road

HISTORY OF THE CUPS UP AT SAVANNAH

GRAND PRIX						
Year	Distance Miles	Starters	Finishers	Winner	Time	M.P.H.
1908	402	20	9	Wagner, Fiat.....	6:10:31	65.111
1909—No race						
1910	415.2	15	6	Bruce Brown, Fiat.....	5:53:05.35	70.55
VANDERBILT						
1904	284.4	18	2	Heath, Panhard.....	5:26:45	52.2
1905	283	20	4	Hemery, Darracq.....	4:38:08	61.4
1906	297.1	18	5	Wagner, Darracq.....	4:50:10	60.8
1907—No race						
1908	258.6	19	2	Robertson, Locomobile..	4:00:48	64.3
1909	278.08	15	2	Grant, Alco.....	4:25:42	62.8
1910	278.08	30	10	Grant, Alco.....	4:15:58	65.18
SAVANNAH CHALLENGE						
1908	342	8	5	Strang, Isotta.....	6:21:30	53.7
1909—No race						
1910	276.8	6	3	Dawson, Marmon.....	4:23:39	62.75
TIEDEMAN TROPHY						
1910	190.3	8	5	Knipper, Lancia.....	3:19:22.67	57.27



THE TIEDEMAN TROPHY

was thrown open to the public, being used constantly all the while by service cars. It is said that the use of the roads by the public has improved rather than hurt the course. Traffic will be allowed on the course up to the very day of the races except during the hours that the course is set aside for practice by the racing teams.

Many Turns Eliminated

Another improvement over the roads over which the races were held last year is the elimination of many of the S turns and the serpentine curve at Thunderbolt, the widening of the roads and the banking of the turns. In a number of instances entirely new stretches of road

well, of Savannah; foreign cars through the recognized motor club in the country in which the car is manufactured, which club is the representative of the Automobile Club of America in that country. If the number of cars entered are too great, taking into account the length of the course, the contest committee of the Automobile Club of America is authorized to eliminate the necessary number of cars.

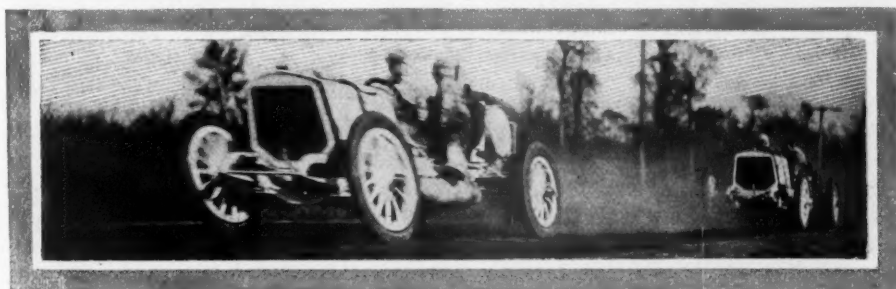
In connection with the grand prize race, but on the Monday preceding Thanksgiving, the seventh competition for the William K. Vanderbilt, Jr., cup will be run with the official sanction of the contest

board of the American Automobile Association, approved by the Manufacturers' Contest Association. The car covering the required distance in the shortest elapsed time will be awarded the cup. The award of the cup carries an additional award of \$2,000 in cash, and to the winner of the cup and cash there will be awarded a special donor's trophy for permanent ownership.

The Small Car Races

The second competition for the Tiedeman trophy and the fourth road race for the Savannah challenge trophy, will be run together as separate classes of one race. The Tiedeman trophy race will be conducted under the rules and with the sanction of the contest board of the American Automobile Association. Both of these races, as well as the grand prize and the Vanderbilt cup events, will be conducted under the auspices of the Savannah Automobile Club. The award of the trophy in each of the light-car events carries an additional award of \$1,000 in cash. In the Savannah challenge race will be awarded also a donor's trophy for permanent ownership.

Each car in all the races must carry



TWO LOZIER'S IN A TRAINING BRUSH

have been built through the cut-offs in order that the bad stretches might be done away with. The result is a much faster and a much safer course than formerly. Everything possible has been done to make for speed and to minimize danger. It cost the Savannah Automobile Club \$50,000 to perfect the course.

First in importance in the events to be run will be the third international road race for the grand prize of the Automobile Club of America, a gold challenge cup of the value of \$5,000. The race will be run under the auspices of the Savannah Automobile Club, with the sanction of the Automobile Club of America. Both American and foreign cars are eligible to compete, but no more than three cars of any one make can be entered. American entries are made direct to William B. Stil-



NEW TURN ON LA ROCHE AVENUE WHICH IMPROVES COURSE



BANKED TURN CONNECTING NORWOOD AND LA ROCHE AVENUES

two passengers, driver and mechanic, seated side by side. All cars taking part in the grand prize race must have a reverse gear driven by the motor, an exhaust that is not directed towards the ground, and the overall width of the car must not exceed 6 feet 2 inches. Every agent of oxidation other than atmospheric air is forbidden. There are no other restrictions in this race, but each car taking part in the race must be subjected to a preliminary examination by the technical committee of the Automobile Club of America. The length of the course is approximately 17 miles, which shall be covered twenty-four times, making the racing distance about 408 miles.

The Vanderbilt

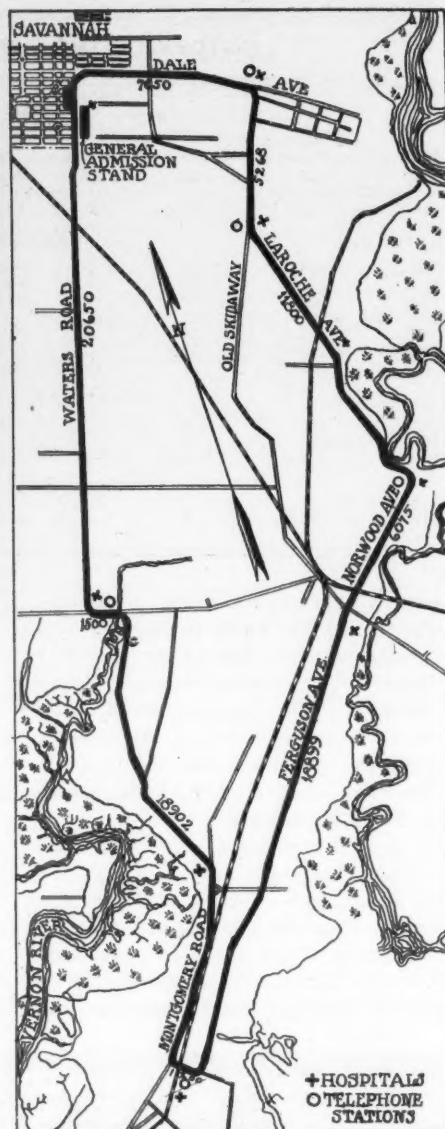
The Vanderbilt cup race, a class C event, is open to any gasoline car or chassis made by a factory that has during the last 12 months prior to the date of the contest produced at least fifty cars, not necessarily of the same model. Cars are eligible for entry under the piston displacement limitations of 301 to 450 cubic inches for division 4-C, and 451 to 600 cubic inches for division 5-C, but without minimum weight restrictions. Repairs must be made exclusively by the crew of the car, but each contestant entering one car shall be entitled to five pit attendants, but only two shall be permitted to make replacement of gasoline, oil and water and replacement or replenishment of tires, or crank the motor, and they must not under any circumstances pump air or oil into the car.

The Savannah challenge trophy race is for class C cars of 231 to 300 cubic inches displacement, and the Tiedeman cup race for cars whose displacement ranges from 161 to 230 cubic inches. In the Savannah challenge trophy the course must be covered thirteen times, making a total distance of 221 miles. In the Tiedeman trophy, also class C, the course shall be

covered ten times, making a total of 170 miles. The rules governing these races are similar, and are based upon the rules governing the running of the grand prize and Vanderbilt cup races. In the latter race the course must be covered seventeen times, making a total distance of 289 miles.

Course Ready Early

The course has been made ready for the racers earlier than it has ever been before. It is not only improved by the widening of the more narrow portions, the elimination of some of the crooked portions by new straightaway cuts through them and by the lengthening and banking of turns, but it has a far better surface than ever before and has been oiled in a more satisfactory manner. That this has been accomplished and the course made ready earlier than usual is a source of much satisfaction to the race officials as well as to the drivers. The opening of the course for official practice Monday



MAP OF SAVANNAH COURSE

Circuit as drawn by H. M. Chapman; copyrighted by G. Reuben Butler

means that the drivers will have ample time to become familiar with the changes that have been made and the performance of their cars.



SHOWING EXTRA WIDTH GIVEN THE ROAD

CONDITIONS OF THE RACES

GRAND PRIX

Date—Thursday, November 30, 1911.
Distance—Twenty-four times around a 17-mile circuit, or approximately 408 miles.

Conditions—The race shall be run under the racing rules of the Automobile Club of America, and such additional rules for the race as may be adopted by the contest committee of the Automobile Club of America.

Entry Fee—One car, \$1,000; two cars, \$1,500; three cars, \$1,750—of the same manufacture.

Prizes—To winner, gold challenge cup given by the Automobile Club of America, valued at \$5,000, and \$4,000 in cash; second prize, \$2,000; third prize, \$1,000.

VANDERBILT CUP

Date—Monday, November 27, 1911.
Distance—Seventeen times around a 17-mile circuit, or approximately 289 miles.

Conditions—Open to class C, divisions 4-C and 5-C, 301 to 450 cubic inches piston displacement, without minimum weight restrictions.

Entry Fee—Each car, \$500.

Prizes—To the winner, the Vanderbilt cup and an additional award of \$2,000 in cash. To the winner of the cup and cash will be awarded a special donor's trophy for permanent ownership.

SAVANNAH CHALLENGE CUP

Date—Monday, November 27, 1911.
Distance—Thirteen times around a 17-mile circuit, or approximately 221 miles.

Conditions—Open to class C, division 3-B, for cars of 231 and including 300 cubic inches piston displacement, minimum weight of cars 1,500 pounds.

Entry Fee—One car, \$250; two cars, \$400; three cars, \$500—of same manufacture.

Prizes—To the winner, the Savannah challenge trophy and a cash award of \$1,000 in cash. In addition the winner will receive a special donor's trophy for permanent ownership.

TIEDEMAN TROPHY

Date—November 27, 1911.
Distance—Ten times around a 17-mile course, or approximately 170 miles.

Conditions—Open to class C, division 2-B, for cars of 161 and including 230 cubic inches piston displacement, minimum weight of cars, 1,200 pounds.

Entry Fee—One car, \$250; two cars, \$400; three cars, \$500—of the same manufacture.

Prizes—To the winner, the Tiedeman trophy and a cash award of \$1,000.



NEW BANKED TURN NEAR MONTGOMERY AVENUE

More than \$20,000 extra prize money has been hung up for the winners of these races. A large portion of this money is offered in gold by the Savannah Automobile Club, while tire concerns and accessory manufacturers have contributed largely with the proviso that the winners must be equipped with the products of the concerns offering the prizes. There will be first, second and third prizes in all of the races. The money in sight is an inducement to the drivers outside of the honor of having won the race.

The greatest interest centers in the race for supremacy between the Fiat and Benz teams. Both of these concerns have three entries each in the grand prize. David Bruce-Brown, who won this race last year in a Benz car, will pilot a Fiat this time. Victor Hemery will try to retain the cup in the Benz camp. The drivers of all six cars are renowned pilots. The Fiat team will be composed of Bruce-Brown, Caleb

S. Bragg and Louis Wagner. The Benz company will be represented in the race by Hemery, Erwin Bergdoll and Eddie Hearne. The Benz cars are 120 horsepower, while the Fiat mounts are only 90. Bergdoll succeeds Bob Burman as a Benz pilot, Burman having recently retired from the team because of differences with his company in the matter of equipment.

Everything is now in readiness for the cars to face the starter. The officials of the Automobile Club of America and the American Automobile Association are on the ground. All of the minor officials have been selected. The course has been declared finished and turned over to the racers after having been pronounced by experts as nearly perfect as it is possible for the ingenuity of man to make it. That the races this year will be more successful than any that have preceded them is confidently expected. Certainly there will be seen on the course the greatest aggregation of racing craft and drivers ever assembled in one spot.

Fatality in First Practice

Savannah, Ga., Nov. 20—Special telegram—First practice for the road races next week resulted in accidents in which one driver was killed and another badly injured, while a mechanic also was hurt. Jay McNay, the Californian, member of the Case team, was the one to meet death, while his mechanic, M. F. Maxwell, was injured. Joe Dawson, of the Marmon team, was injured in another accident, both of which seem to have been caused by failure to properly guard the course during practice.

The cause of the accident to McNay was a wagon. Mechanic Maxwell says that just before reaching Cattle park they got the flag showing the course to be clear. McNay stepped on the throttle and then the wagon loomed up. The Case pilot swung to one side and the car skidded into a tree. McNay's chest was



BEGINNING OF NEW TURN ON NORWOOD AVENUE

crushed by the steering wheel and death was instantaneous. Maxwell's arm was broken in three places, his left side bruised and his face lacerated. He is now in the hospital.

Dawson had just changed seats with Nikrent, who was in the car with him. The Marmon was approaching Bethesda on Whitfield avenue, at which point the road is a trifle narrow. A touring car was discovered ahead. Nikrent took the side of the road, but he was going too fast and Dawson was thrown from his seat. Knipper and Barnes in Mercers were following the Marmon. Knipper stopped in time, but Barnes failed to note that his mate had clapped on the brakes and he smashed into the Mercer. Both cars were damaged, but none of their occupants was injured.

If Dawson is unable to drive Nikrent will take his place in both the big events. Bruce Keene probably will drive in the Savannah challenge and Patschke will be in all three events.

Time Made in Practice

The first official practice was held today. De Palma, who made the two fastest laps in the grand prix in 1908, drove one lap at the rate of 75.9 miles per hour in his Vanderbilt Mercedes. Barnes in a Mercer made the fastest time among the small cars—66 miles an hour. Following are the results:

Bragg, Flat—15:50, 15:09: fastest lap, 67.5 miles per hour.
 Matson, Flat—20:17, 17:14, 15:09.2, 16:15.1: fastest lap, 70 miles per hour.
 Bergdoll, Benz—15:41.3, 13:47.4, 13:54.1: fastest lap, 74.8 miles per hour.
 Hearne, Benz—15:30, 13:47, 19:14.2: fastest lap, 75 miles per hour.
 Wagner, Flat—14:31.4: fastest lap, 70.7 miles per hour.
 Hemery, Benz—13:48.3, 15:04: fastest lap, 73.9 miles per hour.
 Wishart, Mercedes—16:39.3, 15:10.3, 33:43.3: fastest lap, 67.2 miles per hour.
 Parker, Flat—13:57.3, 15:50.3, 17:20.4, 16:22.3: fastest lap, 73.8 miles per hour.
 Disbrow, Pope-Hartford—15:45.2: fastest lap, 65.1 miles per hour.
 Grant, Lozier—14:07.1, 15:02.1: fastest lap, 72.3 miles per hour.
 De Palma, Mercedes—17:41.3, 13:40.2, 15:27.3: fastest lap, 75.9 miles per hour.
 Mulford, Lozier—33:02.4: fastest lap, 31 miles per hour.
 Light cars—Disbrow, Case, 15.25: Hughes, Mercer, 16.40: Barnes, Mercer, 15.35.

Mortimer Roberts in an Abbott-Detroit; Witt, E-M-F, and Evans, E-M-F, also were out, but did not make complete rounds of the course from the grand stand.

Brown Hits 80 Miles Per Hour

Savannah, Ga., Nov. 21—Special telegram—Today brought on more records as far as speed for one lap was concerned. David Bruce-Brown travelled over the course at rate of 80 miles per hour which is the road record here. Summaries:

Bruce-Brown, Flat—13:40, 12:57%, 14:18, 14:15, 14:30%.
 Wishart, Mercedes—14:38%, 13:27%, 13:29%, 13:32%.
 Mulford, Lozier—13:45%, 22:38%, 17:38%.
 Hughes, Mercer—15:47, 13:36%, 15:20.
 Disbrow, Pope Hummer—15:30, 13:43.
 Matson, Flat—13:30, 13:26%.
 Grant, Lozier—14:23, 14:17.
 De Palma, Mercedes—15:04, 32:34%, 35:02.
 Bergdoll, Benz—13:45.
 Mitchell, Abbott-Detroit—16:26%.
 Bragg, Flat—15:18%.

First Report of General Motors Co.

Total Net Profit for 10 Months Is \$4,066, 176, Which Is Reduced to \$2,474,176 By Taking Out Interest on Bond Issue and Dividends of 7 Per Cent on the Preferred Stock

DETROIT, Mich., Nov. 20—The big news of the past week locally was the appearance of the first annual report of the General Motors Co. under the new organization, which became effective in November, 1910. It indicates that the business of the great corporation is in a most satisfactory condition and is further evidence of the healthful state of the industry.

The report covers a period of 10 months, ending July 31, the company having changed its fiscal year to conform more closely with the manufacturing season. The showing made in that time is a reflection of the very efficient organization that has been built up under the direction of President Thomas Neal and the new board of directors. Because of Mr. Neal's connection with the business and the fact that the general offices of the corporation are now located here, there is considerable local interest in the report. That a direct benefit has accrued to the city and to the local industry by the transfer of the offices from New York cannot be gainsaid.

Report in a Nutshell.

From the report, it appears that the total net profit for the 10 months' period, after the deduction of expenses, including maintenance, depreciation, selling and administration, was \$4,066,251. Of this amount the interest on the bond issue called for \$750,000, and the dividends, at the rate of 7 per cent on the \$14,393,500 of preferred stock, for \$842,074, leaving undivided profits of \$2,474,176.

On October 1, 1910, the profit and loss surplus amounted to \$1,165,082, and adding the surplus for the 10 months the total surplus for the period was \$3,639,250. From this amount \$2,000,000 is taken out to reduce the inventories of October 1, 1910, and \$399,084 in the adjustment of claims which arose prior to October 1, 1910, leaving the profit and loss surplus to be carried over at \$1,240,175.

The outstanding capital stock of the corporation amounts to \$14,393,500 preferred and \$15,822,330 common. The outstanding bonds aggregate \$13,454,000, a total of \$1,546,000 having been acquired and cancelled by October 1, 1911. Aside from the bonds, the current indebtedness of the company amounted to \$2,143,847.

The balance sheet shows assets aggregating \$54,388,072.58, as compared with \$51,995,468.76 on September 30, 1910. The net working capital, as shown by the balance sheet, is \$23,065,353. Expenditures charged to capital account totaled \$1,803,030, of which \$700,000 went into additional land and buildings for the Cadillac Motor Car Co. The company, it appears, owns

\$14,111,003 of the \$15,564,003 outstanding common stock of the twenty-one subsidiary companies and all but \$50,000 of the outstanding preferred stock.

In handing the report to the stock holders, President Neal pointed out that while a year ago several of the factories were shut down, and manufacturing operations at other factories greatly curtailed, the period since has been marked by a gradual resumption of activity in all the plants, and nearly all of them are in full operation. Mr. Neal also refers to the efforts that have been made to improve the quality of the materials going into motor cars and to raise the standard of workmanship. The appointment of a director of production and the establishment of what is a complete testing laboratory were in line with this effort. Reference also is made by Mr. Neal to the development of the company's export business, and it is now proposed to make the Bedford Motors Co., of London, England, which is a constituent of General Motors, the distributing branch for the continent of Europe.

The production and sale of commercial vehicles have also been given special attention, and the General Motors Truck Co. was incorporated as a selling organization to handle the output of the companies manufacturing motor trucks.

Still further evidence of the prosperous condition of the industry is furnished by a statement just given out by the Chalmers Motor Co. showing an increase of 35 per cent in 1912 business to date over the same period in 1911. From July 8, when it made its announcement for 1912, to November 18, the company shipped 3,880 cars. At that the factory is behind orders, it is stated, although running full capacity.

November a Busy Month

Although November is usually the duller month in the year for the industry, the Chalmers company has been putting on additional men during the past 2 weeks and is spending considerable money in the way of betterments. It has just completed a large extension to the motor assembly department and is now installing increased facilities for the testing of motors. The pressing need for additional manufacturing space has made it necessary to move all the offices from one of the floors to a lower floor, crowding them in with others. In addition to these changes, the company is preparing to erect a new warehouse, as previously announced.

Contracts were let the past week for a large addition to the Scripps Motor Car Co.'s plant on Clinton street and work already is under way. Work also is about

Oklahomans Plan Sensational Stunt

Eighteen Hundred Teams and Many Enthusiasts Prepared to Build 30 Miles of New Road Across Lincoln County In 1 Day—Highway to Be Made of Asphalt and Macadam

to start on the Hupp Motor Car Co.'s new plant at Milwaukee and Mt. Elliott avenues. The plans have been prepared by Architects Dunlap and Palmer and the contracts let. Thus the company will have new factories going up on both sides of the river at the same time, ground having been broken for its Canadian branch in Windsor, Ont., some time ago.

The Anderson Electric Car Co. shipped its first trainload of Detroit electrics from the factory last Thursday. The company has many orders ahead and is running full time. Ten models are being manufactured this year, one of the latest being a smart roadster with a 96-inch wheelbase, a wheel steer and a control device on the wheel.

MAIS JOINS E-M-F

Detroit, Mich., Nov. 20—A. F. Mais has resigned as chief engineer of the Mais Motor Truck Co. of Indianapolis, and accepted a position as consulting engineer for the Studebaker Corporation, E-M-F company. The old Ford plant located near the E-M-F factory in Detroit has been absorbed by the Studebaker Corporation and converted into an experimental department. Mr. Mais is in charge of this department, which is known as plant No. 10. His office as vice-president of the Mais Motor Truck Co. is still retained, together with his interest in the concern; but feeling that the design of the Mais truck is good enough to hold for sometime without him, he has accepted his new position for the excellent opportunities that it offers in the way of achievement.

MITCHELL BROADENS SCOPE

Racine, Wis., Nov. 21—It was announced here today that the Mitchell-Lewis Motor Co. has arranged for the production of commercial vehicles and trucks for 1912 delivery and for the manufacture of all tops, bodies and other equipment used in its production in the future in its own shops. The extension is provided for by loans of \$2,500,000 negotiated yesterday through New York and Chicago banks. The loans will be used to refund all present banking obligations and the establishment of departments for the manufacture of trucks, bodies and tops.

It is expected that the production for 1912 will amount to 6,000 cars. In addition to four types of pleasure cars, a 6-60, a 6-48, a 4-40 and a 4-30, the Mitchell line will include commercial cars in various sizes. The Mitchell-Lewis Motor Co. is capitalized at \$10,000,000. It is a consolidation of the Mitchell Motor Car Co. and the Mitchell-Lewis Wagon Works, Ltd.

CHANDLER, Okla., Nov. 20.—Establishing a record in Oklahoma in road building, 1,800 teams, aided by as many men, will construct a highway across Lincoln county, of which Chandler is the county seat, between the rising and the setting of the sun, some day prior to December 1.

The good roads association of this county has held many meetings during the present month in connection with the meetings of the trustees of the townships which the road will pass through, and the preliminary work has been passed. Lincoln county will have a 30-mile road of modern construction and the record part consists in the fact that not one penny of actual money will be used in the work.

Volunteers cheerfully agreed to cooperate, business men offered to give their manual services and farmers offered the use of their teams. Half of the roadway will be constructed of asphalt and macadam and the remaining 15 miles will be built of sand and clay. Many farmers prefer the dirt surface for the reason that their horses are unshod a large portion of the time.

But the great number of farmers who own motor cars clamored for at least half of the 30-mile road to be of hard surface so that motoring would be a pleasure, regardless of muddy weather. The motor-owning farmers were strong enough to get their wish and within a few weeks it will be possible to motor across Lincoln county in less than 30 minutes, a feat which the red men, the pioneers who laid out the trail now about to be made into a country speedway, thought impossible. The construction of this single line of road has attracted the attention of farmers in other parts of the county and petitions are already being prepared to build laterals and other lines of the same kind to give Lincoln county the best system of country roads in the state.

AKRON COUNTS ON BIG YEAR

Akron, O., Nov. 20—Local tire manufacturers, whose plans for 1912 are now complete, predict that the coming season's business will be considerably larger than that of last winter. Akron has 17,000 rubber workers, and at least 2,000 more will be employed to take care of the winter's production of tires for next season's cars. This activity is based on orders already in sight.

Local manufacturers ascribe some of the extra activity to the development of motor car trade in rural districts. A second reason is that there is a more general use of cars in winter than formerly. The third

reason is the development of motor trucks and a consequent demand for tires for that type of work.

"Things are picking up and business is becoming more and more stable during the winter season," says C. B. Raymond, secretary of the B. F. Goodrich Co. "We expect that the coming national election will have some effect on the rubber business as it has on all other lines of trade, and consequently no immense supply of raw material is being stored locally and the finished product will be kept down pretty nearly to actual orders. But the demand itself is increasing and I look forward to a very good year in spite of the election."

CLOSE CALL AT CHALMERS PLANT

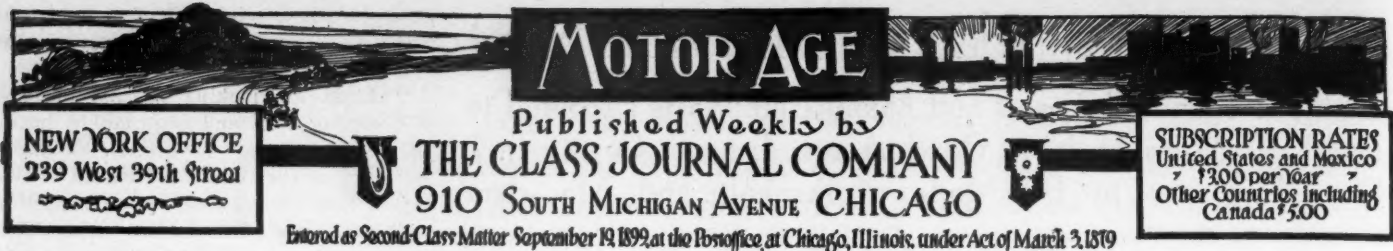
Detroit, Mich., Nov. 20—An explosion of gas in an enameling oven, in the plant of the Chalmers Motor Co., this morning, demolished the oven, tore out all the windows in the rear of the fourth floor of the building, the easternmost of the three large buildings that constitute the plant, and slightly injured two or three workmen. The oven was one of five in the enameling room. Just prior to the explosion the gas had been turned off in it and it is thought that some workman thoughtlessly or accidentally turned it on again without lighting, the gas being ignited by the heat from a neighboring oven. There were about twenty-five men at work in the immediate vicinity of the oven at the time of the explosion, and that all of them escaped serious injury is regarded as miraculous. One man's clothes were torn from him, but he did not receive as much as a bruise. Several were struck by flying bits of glass. The explosion did not interfere in any way with the manufacturing operations. The damage is estimated at about \$2,000.

COAST-TO-COAST RUN ENDS

Los Angeles, Cal., Nov. 25—Over bad roads, good roads and indifferent roads, the first pay-as-you-enter motor train with twelve passengers aboard arrived in Los Angeles last night, completing the journey from New York city to the Pacific coast, a distance of over 4,200 miles in less than 2 months.

The excursion, which was under the management of the Raymond & Whitcomb touring agency of New York, is declared to have been successful in every way and the four big Garford touring cars, which composed the unique train, seemed to have suffered not at all from their arduous trip across the continent. Even the big Garford truck, which carried extra Goodyear tires, with which all the cars are equipped, and the baggage and tools, moved along the downtown streets as though it had just left the shops.

The party made the last leg of the journey from San Diego to Los Angeles, which is over an unexcelled road, according to schedule, arriving in Pasadena in time for a big banquet.



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MOTOR AGE

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Locating the Gasoline Tank

THE question of the eventual location of the gasoline tank is far from being settled. Up to the present this part of the car has not received much attention. Under the front seat, has been considered one of the best locations, it being accessible for filling with fuel and also being a good location to give a good gravity pressure on the carbureter for hill-climbing work. This location also has that advantage of being in one of the easiest riding parts of the car, and so the chances of injury to the tank because of vibration are reduced to a minimum. In this position the tank is also well protected against injury by stones being thrown against it by the road wheels. The one big objection to this position of the tank is its lack of accessibility in case of injury, it necessitating the removal of the body to perform a simple soldering task. Because of this inaccessibility feature the cost of repair is made very high, and when troubles, such as leaks, arise, it becomes a serious one and, as has been demonstrated time and time again, hours are needed to make a very simple repair. With the tank under the front seat of the car valuable space that otherwise might be utilized for carrying tools or baggage is absorbed.

THE method of carrying the gasoline tank under the chassis frame and behind the back axle has been adopted by many builders. In this position pressure must be used to force the gasoline from this tank to the carbureter. This pressure can be obtained in two ways: First, the exhaust line or manifold can be tapped and a reducing valve inserted to give the pressure necessary to force the gasoline into the float chamber. Instead of using exhaust pressure for this work not a few makers have adopted the second scheme, namely, that of fitting a small motor-driven airpump on the crankcase and using its air pressure to force the gasoline. Whenever the tank is carried under the rear of the chassis it is in danger of puncturing by stones, which often happens. As a protection a guard for the tank, made of narrow wood strips, has been adopted and is a most satisfactory solution. It does not add much weight and protects the tank from stones and other substances that might work injury. The big advantage of this position is that of accessibility. As the tank is usually secured by a couple of metal strips or other brackets, it is a short job to remove the tank in case of a leak. The tank, being more exposed, also is in a better position for a soldering job without removing it. Best of all, however, in this tank location comes the advantage of leaving the space under the front seat free for tools, baggage or other uses. Baggage room is always limited, and if the gasoline tank can be carried outside, the better for the car and for the convenience of the driver and passenger.

IN the reviews of the recent Olympia show as well as in the forecasts of the foreign machines for next year it has been noted that many makers are carrying the gasoline tank under the hooded or cowed dash. This is an excellent location. Bringing the weight up into the center of the chassis eliminates the tendency to skid, it being a well-known fact that the more weight that is carried back of the rear axle the greater is the tendency to skid on corners or on slippery roads. Locating the gasoline tank under the dash is good economy. It puts it in a position where gravity feed can be used. This should be cheaper than

where pressure feed is needed. Carrying the tank in the dash also brings it up into a well-protected place where it cannot possibly be injured by stones or other missiles. When located in the dash it is possible to fit a very simple gauge to the side of the tank showing the level of the gasoline. This is a much desired feature. Plenty of gasoline tanks are today fitted with gauges, but these gauges are under the front seat or in some other position where the drivers have to go specially in order to see them. What is needed is a gauge in front of the driver, a gauge that is before his eyes the same as the switch or oil sight feed. There is one other point in favor of the gasoline tank on the dash, and that is the reduction in the length of piping from the tank to the carbureter. When in this position this length is reduced to the very inside measurement. With a short pipe the danger of leaking is reduced and the original cost should also be lessened.

LOOKING at the car in general, it is questionable if any more favorable position can be found for the tank than within the dash. Particularly is this so with the heavily hooded or cowed types. Sitting in the front seats of many of the cars of this type, one cannot but be struck with the vast amount of wasted space. The dash is away under the cowl, so far, in fact, that it is difficult to see the necessary parts of the control that are carried in it. Much of this space is wasted, and the locating of the fuel tank here is an economic investment. Not only is the space conserved but the tank is actually easier to fill in this position than were it under the front seat or even in rear of the back axle. The filled cap can be carried up through the cowl and be easily accessible for filling purposes.

ONE maker has for 1912 adopted a commendable position for both the gasoline and oil tanks, namely, making both of these tanks long cylindrical bodies and carrying them longitudinally under the chassis, one between the propellershaft and the right side frame member and the other in a similar position on the left side. Filler pipes are elbowed and brought to the outside of the frame, over the running board, where good accessibility is obtained. By actual experiment it has been found that with a low tank position like this, skidding has been perceptibly reduced and there is less strain on the car when rounding a corner on a dry road. It has been discovered that it is possible to take turns faster with this location. Naturally the lower the tanks can be carried and the nearer to the center of the car, the better it is. There is plenty of spare room under the car at these places. In some cars the present location of the muffler might interfere with this design, but it is not difficult to alter the muffler location. The greatest objection to this location is that the tanks must be protected against stones thrown up by the wheels, which can be met by using heavy material and perhaps using a wood or other guard. There is ample room in this location for a tank of from 24 to 30 gallons' capacity. The filler pipe construction is more expensive than where the tank is carried under the front seat, within the dash, or under the chassis at the rear. It is clearly apparent that the designers are studying this proposition and that on the models that are yet unborn some satisfactory method of tank location will be reached by the motor car engineers.

Georgians Support Tour Around State

ATLANTA, Ga., Nov. 20.—A striking example of the trend of popular favor toward non-technical, nearly non-competitive motor runs will be given by the tour around Georgia, which will start from Atlanta Wednesday with certainly well over fifty cars in line.

That such a number of entries can be secured in a state where motor cars are not as numerous as they are in the eastern states, at a time when vacations are all over, for a jaunt which will include 6 days of touring and 5 days at Savannah shows something of the popularity of near-sociality runs.

In this event there will be no technical requirements, 18 miles an hour will be the fastest speed required, contestants may run during the noon hour without having it counted in their running time, and any repairs can be made at any time. If repairs are made while the cars are in controls it will not be charged against the cars. Under conditions of this sort the tour around Georgia has been able to secure a highly creditable list of entries.

The night stops of the tour will be Americus, Valdosta, Baxley, Savannah, Dublin and Atlanta. The officials already chosen are Joe Brown Connaly, referee; R. C. Clarke, starter, and P. H. Hammond, checker. Prizes amounting to \$2,600 have been offered, to be divided among the winners in the various classes.

The tourists will spend from the night of November 25 until the morning of December 1 in Savannah, where they will witness the running of the road races.

More road preparations are being made for this tour, perhaps, than were ever made before for a state event. Signboards have been placed at all cross roads and will serve to mark a permanent ideal tour around Georgia. In Bullock and Emanuel counties three bridges have just been completed over streams that have given trouble in previous tours. In these counties, and in Laurens, new strips of road are just being finished, especially for this tour, and hundreds of convicts are toiling long hours on the final touches. The Adrian-Scott cutoff, in Johnson county, also is being completed and will be in fine condition. Unless there is rain, the tourists will have excellent going all the way from Atlanta back to Atlanta. Of course, under the conditions of the tour, not all the competing cars will start from the Georgia capital, but can pick up the tour at any control. All that is required is that they complete the entire circuit. However, most of the contestants will come to the Gate City for the big getaway. The entries up to November 18 were:

1, Atlanta Ad-Men's Club, Atlanta, Overland; 2, Ohio Motor Car Co., Cincinnati, O., Ohio; 3, Dr. J. C. Luke, Ocilla, Ga., Ohio; 4, Ohio Motor Car Co., Ocilla, Ga., Ohio; 5, Jake W. Paulk, Ocilla, Ga., Ohio; 6, W. E. Sawyer, Americus, Overland; 7, S. C. Dunlap, Gainesville, E-M-F; 8, A. M. Kitchen, Cornelia, Ga.,

E-M-F; 9, Balkcom & Ricketson, Boston, Ga., E-M-F; 10, W. V. Kriegshaber, Atlanta, Chalmers; 11, Atlanta Chamber of Commerce, Cole; 12, H. B. Odell, Atlanta, Thomas Flyer, pace-maker; 13, W. D. Alexander, Atlanta, Dorris; 14, Miss Regina Rambo, Marietta, Ga., Overland; 15, T. C. Lauren, Atlanta, Packard; 16, Dr. B. L. Bridges, Ellaville, Ga., Buick; 17, George H. Fauss, Atlanta, Dorris; 18, M. Luke, Jr., Ocilla, Ga., Everitt; 19, Velle Motor Vehicle Co., Atlanta, Velle, press car; 20, Frank G. Corker, Dublin, Ga., White Gas; 22, Sam Bashinski, Dublin, Ga., Chalmers; 23, Dolph Walker, Atlanta, National; 24, Marathon Motor Car Co., Nashville, Marathon, press car; 25, D. Woodward, Atlanta, Knox; 26, J. Leon Bell, Swainsboro, Ga., Cadillac; 27, N. E. McLeod, Swainsboro, Ga., Westcott; 28, U. S. Fuller, Culloden, Ga., Cadillac; 29, D. D. Armstrong, V. P. of T. C. A., Atlanta, Thomas Flyer; 30, Holmes Brothers, Culloden, Ga., Buick; 31, W. A. Ayash, Americus, Ga., Overland; 32, W. A. Thacher, Decatur, Ga., Buick; 33, E-M-F Co., Atlanta, Flanders; 34, E-M-F Co., Atlanta, Flanders; 35, E-M-F Co., Atlanta, Flanders; 36, G. W. Varn, Valdosta, Ga., Cadillac; 37, Evelyn Harris, Thomas Flyer; 38, W. G. Sutherland, Atlanta, Overland; 39, Marvin R. McClatchey, Atlanta, White Gas; 40, F. G. Edwards, Albany, Ga., Chalmers; 41, Robinson Neckwear Co., Atlanta, Marmon; 42, Councilman Steve R. Johnson, Atlanta, Buick; 43, W. B. Cummings, chief Atlanta fire department, Buick; 44, St. Elmo Massengale, Atlanta, Garford; 45, Boyd Perry, Atlanta, Ohio; 46, Gulf

Refining Co., Atlanta, Mitchell; 47, Henry Melnert, Marietta, Maxwell; 48, Georgia Motor Car Co., Atlanta, Liberty Brush; 49, Georgia Motor Car Co., Atlanta, Everitt; 50, Swann & Campbell, Covington, Ga., Buick; 51, Herbert C. White, DeWitt, Ga., Maxwell; 52, William C. Davis, Atlanta, Pope-Hartford; 53, Muckalee Cigar Co., Americus, Marmon.

ROAD WORK IN IOWA

Mt. Ayr, Ia., Nov. 20.—The largest and most enthusiastic good roads meeting ever held in the state of Iowa took place recently with over 700 men, women and children, all good roads boosters, in attendance. Reports were made on road improvements in Ringgold county during the past season and the prizes for the best roads in the county which were offered last May by the Mt. Ayr Commercial Club were awarded upon the recommendations of the road inspectors of the club and state officials, together with the leading motorists of Des Moines, who reported that the best state road work done in the state of Iowa during the 1911 season was that in Ringgold county.

An interesting example of the enthusiasm over good roads and good roads propositions was noted in the reports, which showed that during the road season the farmers of Mt. Ayr and vicinity contributed only \$500 to the cause of good roads, while during the 1911 season, through the influence of state officials, the contributions were nearly \$1,500.

SIGNS OF THE TIMES

Akron, O., Nov. 20.—Summit county, Ohio, of which Akron is the county seat, is trying hard to live down its reputation for having the worst roads in the state of Ohio. The Akron chamber of commerce, under the direction of President Frank A. Seiberling, who also is president of the Goodyear Tire and Rubber Co., has been making an active good roads campaign, co-operating with the county commissioners and township road authorities in making Summit county roads better.

The result of the local good roads campaign and state co-operation already are apparent. Rural paving has been begun on all the main roads leading out of Akron—north, east, south and west. This county has nearly completed a pavement north from the city to connect with the Cuyahoga county pavement and making a continuous paved road from Akron to Cleveland. At the same time, there is activity south, in the direction of Canton, and there will be a through pavement from Cleveland to Canton in a short time.

Thirty-one and a half miles of pavement leading out of Akron in various directions have been completed within the year, and petitions are in for the construction of 25 miles more, which will constitute the county's good roads campaign for next year.



November 27—Vanderbilt road race, Savannah, Ga.

November 30—Grand Prix race, Savannah, Ga.

December 30-January 6—Show of Buffalo Automobile Trade Association, Buffalo, N. Y.

January 6-13—Twelfth annual show, pleasure car division, Automobile Board of Trade, Madison Square garden, New York.

January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.

January 10-17—Annual show, Motor and Accessories Manufacturers, Madison Square garden, New York.

January 10-17—Annual show, National Association of Automobile Manufacturers, Grand Central palace, New York.

January 13-19—Milwaukee show.

January 13-27—Show of Philadelphia Automobile Trade Association.

January 15-20—Twelfth annual show, commercial division, Automobile Board of Trade, Madison Square garden, New York.

January 18-20—Annual meeting Society of Automobile Engineers, New York.

January 22-27—Show at Providence, R. I.

January 22-27—Show at Detroit, Mich.

January 27-February 10—Eleventh annual show under the auspices of the National Association of Automobile Manufacturers, Colliseum, Chicago.

February 5-10—Annual show, Pleasure Car Exhibit, St. Louis.

February 5-17—Show at St. Louis.

February 12-17—Annual show, Commercial Car Exhibit, St. Louis.

February 12-17—Show at Kansas City, Mo.

February 14-17—Show at Grand Rapids, Mich.

February 17-24—Pittsburgh show, Pittsburgh Auto Show Association.

February 17-24—Show at Newark, N. J.

February 17-24—Minneapolis show.

February 19-24—Show at Hartford, Conn.

February 19-24—Seventh annual show of Omaha Automobile Association, Omaha, Neb.

February 21-28—Toronto show.

February 20-28—Baltimore show.

February 26-March 2—Second annual show of Elmira Automobile Club, Elmira, N. Y.

March 2-9—Pleasure car show, Boston.

March 4-9—Show at Des Moines, Ia.

March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.

Another Big Show Building for New York

Official Announcement that Structure Will Be Erected South of Grand Central Palace Which Will Approximate in Shape and Size Madison Square Garden—National Association of Automobile Manufacturers Finds Room for More Exhibitors

NEW YORK, Nov. 21—Official announcement of a preliminary character with regard to the building of a big show structure in New York city was made Tuesday, when Manager Spratt of the Grand Central palace declared that the new structure which will be built south of the present building on Lexington avenue, will approximate in shape and size the present Madison Square garden. It will differ from that building, however, in one very important particular as it will be arranged to seat about 4,000 more than the present structure. The plans have been prepared and at present they are being presented to the New York Central railroad for approval. It is intended that the new building shall be ready for occupancy by next fall.

The three floors of Grand Central palace which will be used for the N. A. A. M. show have a floor space of 128,000 square feet. The new building, according to report, but not officially, will have an exhibition space of about 100,000 square feet. It is intended to connect the two structures by bridged passageways, so that they will be available for one great show in two sections.

One of these will be available for the passenger motor cars and accessories and the other for trucks and accessories. Even under those conditions, space would appear to be at a premium. This may be accounted for by the increasing size of the trucks and the more numerous models in the passenger car lines. The garden, as it is now will barely accommodate all the lines of trucks that seek admission to the annual shows held there, and while it might be possible to conduct a show equal to both weeks of the coming Automobile Board of Trade exhibition in 1 week, it would be found difficult to take care of all the standard cars of American motordom in any building in the world. Thus, the probabilities of the future point to the holding of two distinct shows, each continuing for 1 week. If this is done, New York will have buildings ample in size and facilities for holding such exhibitions.

Final allotments of show space for the exhibition of the National Association of Automobile Manufacturers at the Grand Central palace have been made. There are still a few spaces that have not been definitely filled, but there are also several applications on file from which a selection will be made within a few days.

The following named companies have been added to the list or have had their original space allotments changed in one

way or another: Regal Motor Car Co., main floor, space G; Columbus Buggy Co., main floor, space J-2; Gramm Motor Truck Co., main floor, space M-1; Kelly Motor Truck Co., main floor, space M-2. On the second floor are the following: Chase Motor Truck Co., space A-3; Universal Motor Truck Co., A-4; Westcott Motor Car Co., A-5; L. J. Bergdoll Motor Co., A-6; King Motor Car Co., A-7; Metz Co., A-8; L. E. Schlotterback Mfg. Co., B-1; Newark Auto Mfg. Co., B-2; Velie Motor Vehicle Co., C-1; Bowling Green Motor Car Co., C-2; Progress Development Co., C-3; Vandewater & Co., Ltd., D-2; Veerac Sales Co., D-3; Atterbury Motor Car Co., E-2; A. O. Smith Co., F-2; Stuyvesant Motor Car Co., H-2; Federal Motor Truck Co., H-5; Herreshoff Motor Co., H-6; G. H. Bushnell Press Co., J-4; Atlantic Motor Truck Co., J-5; Motor Wagon Co., K-3; Decatur Motor Car Co., K-4; Dayton Auto Truck Co., L-1; Lauth-Juergens Motor Car Co., L-2; Argo Electric Vehicle Co., L-3; Dart Mfg. Co., M-1.

The list of accessory exhibitors includes the following:

- ACCESSORIES—Third Floor
- A 1—United Rim Co., Akron, Ohio.
 - A 2—Dean Electric Co., Elyria, Ohio.
 - A 3—Booth Demountable Rim Co., Cleveland, Ohio.
 - A 4—Standard Thermometer Co., Boston, Mass.
 - A 5—Motz Clincher Tire and Rubber Co., Akron, Ohio.
 - B 1—Lavigne Mfg. Co., Detroit, Mich.
 - B 2—Power Wagon Publishing Co., Chicago, Ill.
 - B 3—Grip Nut Co., Chicago, Ill.
 - B 4—Motor, 381 Fourth Ave., New York.
 - B 5—Modern Auto Appliances Co., Chatham, N. Y.
 - B 6—Wayne Oil Tank and Pump Co., Ft. Wayne, Ind.
 - B 7—Motor Vehicle Publishing Co., 24 Murray St., New York.
 - B 8—The S. K. F. Ball Bearing Co., 50 Church St., New York.
 - B 11—
 - B 12—Peck Wheel Co., Chicago, Ill.
 - B 13—Horseless Age, New York.
 - C 1—Chas. E. Miller, New York.
 - D 1—Wm. Cramp & Son Ship and Engine Bldg. Co., Philadelphia, Pa.
 - D 2—General Electric Co., Schenectady, N. Y.
 - D 6—Timken-Detroit Axle Co., Detroit, Mich.
 - D 7—Oliver Mfg. Co., Chicago, Ill.
 - E 1—Automatic Motor and Engineering Co., Chicago, Ill.
 - E 2—Class Journal Co., Automobile, New York.
 - E 3—
 - E 4—Calmon Asbestos and Rubber Wks. of America, New York.
 - E 5—Class Journal Co., Motor Age, New York.
 - E 6—E. Edelman & Co., Chicago.
 - E 7—Chilton Co., Philadelphia, Pa.
 - E 8—Automobile Journal Publishing Co., Pawtucket, R. I.
 - E 12—R. I. V. Co., New York.
 - E 13—National Pump Co., Dayton, Ohio.
 - F 1—Narragansett Chemical Co., Providence, R. I.
 - G 2—Goodyear Tire and Rubber Co., Akron, Ohio.
 - H 1—U. S. Tire Co., New York.
 - H 2—Ross Gear and Tool Co., Lafayette, Ind.
 - H 3—Muncie Gear Works, Muncie, Ind.
 - H 4—Edison Storage Battery Co., West Orange, N. J.
 - H 5—Adam Cook's Sons, New York.
 - J 1—Warner Instrument Co., Beloit, Wis.
 - J 2—Swinehart Tire and Rubber Co., Akron, Ohio.

- J 3—Wheeler & Schebler, Indianapolis, Ind.
- J 4—Empire Tire Co., Trenton, N. J.
- J 5—McCue Co., Hartford, Conn.
- K 1—Diamond Rubber Co., Akron, Ohio.
- K 2—S. F. Bowser & Co., Ft. Wayne, Ind.
- K 3—B. F. Goodrich Co., Akron, Ohio.
- L 1—Office M. & A. M.
- L 2—Gray & Davis, Amesbury, Mass.
- L 3—Firestone Tire and Rubber Co., Akron, Ohio.
- M 1—Veeder Mfg. Co., Hartford, Conn.
- M 2—Fisk Rubber Co., Chicopee Falls, Mass.
- M 3—Breeze Carburetor Co., Newark, N. J.
- M 4—Dorian Demountable Rim Co., New York.
- M 5—Hartford Suspension Co., Jersey City, N. J.
- N 1—National Carbon Co., Cleveland, Ohio.
- N 2—Pennsylvania Rubber Co., Jeannette, Pa.
- N 3—Remy Electric Co., Anderson, Ind.
- N 4—Gemmer Mfg. Co., Detroit, Mich.
- N 5—Stromberg Motor Devices Co., Chicago.

The commercial section of the Chicago show has also undergone some changes and additions which are as follows: White Co., main floor Coliseum, space A-3; Avery Co., C-2; Morgan Motor Truck Co., M-1; Clark Delivery Car Co., M-2; Harder Fireproof Storage and Van Co., N-1. Coliseum annex: Atterbury Motor Car Co., P-2, First Regiment armory, main floor: Wyckoff, Church & Partridge, Inc., A-1 and A-3; Four-Wheel Drive Auto Co., B-1; Sanford-Herbert Co., B-2; Chicago Commercial Car Co., B-3; A. O. Smith Co., B-6; Motor Wagon Co., C-3; Buick Motor Co., C-4; Harwood-Barley Mfg. Co., D-3; Mercury Mfg. Co., D-4; H. E. Wilcox Motor Car Co., D-5; Speedwell Motor Car Co., E-1; Velie Motor Vehicle Co., E-2; Poss Motor Co., E-3; Commerce Motor Car Co., F-2; Service Motor Car Co., G-2; Monitor Auto Works, G-3.

The complete list of accessories for commercial week contains the following:

- COLISEUM—GALLERY—ACCESSORIES
- 1—Model Gas Engine Co., Peru, Ind.
 - 2—Motz Tire and Clincher Co., Akron, Ohio.
 - 3—Motz Tire and Clincher Co., Akron, Ohio.
 - 4—C. T. Ham Mfg. Co., Rochester, N. Y.
 - 5—Kinsey Mfg. Co., Toledo, Ohio.
 - 5a—Kinsey Mfg. Co., Toledo, Ohio.
 - 5b—Standard Roller Bearing Co., Philadelphia, Pa.
 - 6—Atwater Kent Mfg. Works, Philadelphia, Pa.
 - 7—Imperial Brass Mfg. Co., Chicago.
 - 8—Michelin Tire Co., Milltown, N. J.
 - 9—Michelin Tire Co., Milltown, N. J.
 - 10—Driggs-Seabury Ordnance Corp., Sharon, Pa.
 - 11—Warner Gear Co., Muncie, Ind.
 - 12—Pennsylvania Rubber Co., Jeannette, Pa.
 - 13—Pennsylvania Rubber Co., Jeannette, Pa.
 - 14—Remy Electric Co., Anderson, Ind.
 - 15—Swinehart Tire and Rubber Co., Akron, Ohio.
 - 16—Connecticut Telephone and Electric Co., Meriden, Conn.
 - 17—Wheeler & Schebler, Indianapolis, Ind.
 - 18—Diamond Rubber Co., Akron, Ohio.
 - 19—Diamond Rubber Co., Akron, Ohio.
 - 20—N. Y. and N. J. Lubricants Co., New York.
 - 21—Jones Speedometer Co., New York.
 - 22—Weed Chain Tire Grip Co., New York.
 - 23—Whitney Mfg. Co., Hartford, Conn.
 - 24—Briscoe Mfg. Co., Detroit, Mich.
 - 25—R. E. Hardy Co., Chicago.
 - 26—Ajax-Grieb Rubber Co., New York.
 - 27—Ajax-Grieb Rubber Co., New York.
 - 28—Standard Welding Co., Cleveland, Ohio.
 - 29—American Ball Bearing Co., Cleveland, Ohio.
 - 30—Republic Rubber Co., Youngstown, Ohio.
 - 31—Republic Rubber Co., Youngstown, Ohio.

- 32—Timken-Detroit Axle Co., Detroit, Mich.
 33—Timken Roller Bearing Co., Canton, Ohio.
 34—Consolidated Rubber Tire Co., New York.
 35—Consolidated Rubber Tire Co., New York.
 36—McCord Mfg. Co., Detroit, Mich.
 37—A. R. Mosler & Co., New York.
 38—Fisk Rubber Co., Chicopee Falls, Mass.
 39—Fisk Rubber Co., Chicopee Falls, Mass.
 40—National Carbon Co., Cleveland, Ohio.
 41—Badger Brass Mfg. Co., Kenosha, Wis.
 42—Veeder Mfg. Co., Hartford, Conn.
 44—Continental Caoutchouc Co., New York.
 45—G & J Tire Co., New York.
 46—Gray & Davis, Amesbury, Mass.
 47—B. F. Goodrich Co., Akron, Ohio.
 48—B. F. Goodrich Co., Akron, Ohio.
 49—C. F. Splittdorf, New York.
 50—National Tube Co., Pittsburg, Pa.
 51—Goodyear Tire and Rubber Co., Akron, Ohio.
 52—Goodyear Tire and Rubber Co., Akron, Ohio.
 53—Herz & Co., 187 Elm St., New York.
 54—Diamond Chain and Mfg. Co., Indianapolis, Ind.
 55—Wm. Cramp & Sons Ship and Engine Bldg Co., Philadelphia.
 56—Vesta Accumulator Co., Chicago.
 57—J. H. Williams Co., Brooklyn, N. Y.
 58—A. W. Harris Oil Co., Providence, R. I.
 59—Hartford Suspension Co., Jersey City, N. J.
 60—Hartford Suspension Co., Jersey City, N. J.
 61—Baldwin Chain and Mfg. Co., Worcester, Mass.
 62—Continental Motor Mfg. Co., Muskegon, Mich.
 63—Spicer Mfg. Co., Plainfield, N. J.
 64—Pittsfield Spark Coil Co., Dalton, Mass.
 65—Brown-Lipe Gear Co., Syracuse, N. Y.
 66—Weston-Mott Co., Flint, Mich.
 67—Firestone Tire and Rubber Co., Akron, Ohio.
 68—Firestone Tire and Rubber Co., Akron, Ohio.
 69a—Royal Equipment Co., Bridgeport, Conn.
 69b—Electric Storage Battery Co., Philadelphia, Pa.
 70—Oliver Mfg. Co., Chicago, Ill.
 71—S. F. Bowser & Co., Ft. Wayne, Ind.
 72—S. F. Bowser & Co., Ft. Wayne, Ind.
 73—Edmunds & Jones Mfg. Co., Detroit, Mich.
 74—Kokomo Electric Co., Kokomo, Ind.
 75—Byrne, Kingston & Co., Kokomo, Ind.
 76a—U. S. Light and Heating Co., New York.
 76—Stromberg Motor Devices Co., Chicago.
COLISEUM ANNEX—SECOND FLOOR
 77—Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.
 78—Dean Electric Co., Elyria, Ohio.
 79—
 80—
 81—
 82—Auto Parts Mfg. Co., Muncie, Ind.
 83—Eisemann Magneto Co., New York.
 84—W. H. Leland & Co., Worcester, Mass.
 85—Muncie Gear Works, Muncie, Ind.
 86—Leather Tire Goods Co., Niagara Falls, N. Y.
 87—American Circular Loom Co., Boston, Mass.
 88—Covert Motor Vehicle Co., Lockport, N. Y.
 89—Link-Belt Co., Indianapolis, Ind.
 90—Gemmer Mfg. Co., Detroit, Mich.
 91—Havoline Oil Co., New York.
 92—Champion Ignition Co., Flint, Mich.
 93—Detroit Electric Appliance Co., Detroit, Mich.
 97—Lovell-McConnell Mfg. Co., Newark, N. J.
 98—Apple Electric Co., Dayton, Ohio.
 99—Bosch Magneto Co., New York.
 100—Sparks-Withington Co., Jackson, Mich.
 101—Lee Tire and Rubber Co., Conshohocken, Pa.
 102—Warner Mfg. Co., Toledo, Ohio.
 103—Turner Brass Works, Sycamore, Ill.
 104—National Coil Co., Lansing, Mich.
 105—Ross Gear and Tool Co., Lafayette, Ind.
 106—Edison Storage Battery Co., West Orange, N. J.
 107—Federal Rubber Co., Cudahy, Wis.
 108—Stewart & Clark Mfg. Co., Chicago.
 109—Empire Tire Co., Trenton, N. J.
 110—Buda Co., Harvey, Ill.
 111—Stutz Auto Parts Co., Indianapolis, Ind.
 112—United Rim Co., Akron, Ohio.
 115—General Electric Co., Schenectady, N. Y.
 116—Jacobson & Brandlow, Pittsfield, Mass.
 118—Waukesha Motor Co., Waukesha, Wis.
 119—International Acheson Graphite Co., Niagara Falls, N. Y.
 120—Esterline Co., Lafayette, Ind.
 121—Falls Machine Co., Sheboygan Falls, Wis.
 122—Simms Magneto Co., 1780 Broadway, New York.
 123—Western Motor Co., Beloit, Wis.
FIRST REGIMENT ARMORY—GALLERY
 1—Horseless Age, New York.
 2—Atlas Chain Co., Brooklyn, N. Y.
 3—Marburg Brothers, Inc., New York.
 4—Marburg Brothers, Inc., New York.
 5—Detroit Lubricator Co., Detroit, Mich.
 6—Perfection Spring Co., Cleveland, Ohio.
 7—U. S. Ball Bearing Mfg. Co., Oak Park, Ill.
 8—Lefever Arms Co., Syracuse, N. Y.

- 9—Merchant & Evans Co., Philadelphia, Pa.
 10—Punctureless Tire Co. of Illinois, Chicago.
 11—Garage Equipment Mfg. Co., Milwaukee, Wis.
 12—Torbensohn Gear and Axle Co., Bloomfield, N. J.
 13—Rhineland Machine Works Co., New York.
 14—Aristos Co., New York.
 15—Aristos Co., New York.
 16—Milwaukee Oil Pump and Tank Co., Milwaukee, Wis.
 17—Wisconsin Motor Mfg. Co., Milwaukee, Wis.
 18—S. Hoffnung & Co., New York.
 19—Findeisen & Kropf Mfg. Co., Chicago.
 20—Automobile Journal Publishing Co., Pawtucket, R. I.
 21—American Bronze Co., Berwyn, Pa.
 22—Sheldon Axle Co., Wilkes-Barre, Pa.
 23—Power Wagon Pub. Co., Chicago.
 24—Michigan Magneto Co., 117 Bagley Ave., Detroit, Mich.
 25—Lavigne Mfg. Co., Detroit, Mich.
 26—Lavigne Mfg. Co., Detroit, Mich.
 27—John L. G. Dykes Co., Chicago.
 28—Clucker & Hixson Co., New York.
 29—
 30—Motor, New York.
 31—Van Cleef Brothers, Chicago.
 32—Norton Grinding Co., Worcester, Mass.
 33—Chicago Steel Foundry Co., Chicago.
 34—Chilton Co., Philadelphia, Pa.
 35—Class Journal Co., Motor Age, New York.
 36—Hydraulic Oil Storage Co., Detroit, Mich.
 37—
 38—
 39—Dayton Engineering Laboratories Co., Dayton, Ohio.
 40—Class Journal Co., Automobile, New York.
 Official and final allotments for the Chicago show of the National Association of Automobile Manufacturers contain the following changes and additions: Warren Motor Car Co., First Regiment armory, space G-1; Flanders Mfg. Co., H-1. Coliseum basement: Westcott Motor Car Co., 2; Crow Motor Car Co., 3; L. J. Bergdoll Motor Co., 7; Colby Motor Co., 11; Lexington Motor Car Co., 12; Standard Electric Car Co., 14; King Motor Car Co., 16; George W. Davis Carriage Co., 17.

The accessory exhibitors and their locations are as follows:

COLISEUM GALLERY—ACCESSORIES

- 1—Hayes Mfg. Co., Detroit, Mich.
 2—Motz Clincher Tire and Rubber Co., Akron, Ohio.
 3—Motz Clincher Tire and Rubber Co., Akron, Ohio.
 4—C. T. Ham Mfg. Co., Rochester, N. Y.
 5—Kinsey Mfg. Co., Toledo, Ohio.
 5a—Kinsey Mfg. Co., Toledo, Ohio.
 5b—Standard Roller Bearing Co., Philadelphia, Pa.
 6—Atwater-Kent Mfg. Works, Philadelphia, Pa.
 7—Imperial Brass Mfg. Co., Chicago.
 8—Michelin Tire Co., Milltown, N. J.
 9—Michelin Tire Co., Milltown, N. J.
 10—Driggs-Seabury Ordnance Corp., Sharon, Pa.
 11—Warner Gear Co., Muncie, Ind.
 12—Pennsylvania Rubber Co., Jeannette, Pa.
 13—Pennsylvania Rubber Co., Jeannette, Pa.
 14—Remy Electric Co., Anderson, Ind.
 15—Swinehart Tire and Rubber Co., Akron, Ohio.
 16—Connecticut Telephone and Electric Co., Meriden, Conn.
 17—Wheeler & Schebler, Indianapolis, Ind.
 18—Diamond Rubber Co., Akron, Ohio.
 19—Diamond Rubber Co., Akron, Ohio.
 20—N. Y. and N. J. Lubricant Co., New York.
 21—Jones Speedometer Co., New York.
 22—Weed Chain Tire Grip Co., New York.
 23—Whitney Mfg. Co., Hartford, Conn.
 24—Briscoe Mfg. Co., Detroit, Mich.
 25—R. E. Hardy Co., Chicago.
 26—Ajax-Grieb Rubber Co., New York.
 27—Ajax-Grieb Rubber Co., New York.
 28—Standard Welding Co., Cleveland, Ohio.
 29—American Ball Bearing Co., Cleveland, Ohio.
 30—Republic Rubber Co., Youngstown, Ohio.
 31—Republic Rubber Co., Youngstown, Ohio.
 32—Timken-Detroit Axle Co., Detroit, Mich.
 33—Timken Roller Bearing Co., Canton, Ohio.
 34—Consolidated Rubber Tire Co., New York.
 35—Consolidated Rubber Tire Co., New York.
 36—McCord Mfg. Co., Detroit, Mich.
 37—A. R. Mosler & Co., New York.
 38—Fisk Rubber Co., Chicopee Falls, Mass.
 39—Fisk Rubber Co., Chicopee Falls, Mass.
 40—National Carbon Co., Cleveland, Ohio.
 41—Badger Brass Mfg. Co., Kenosha, Wis.
 42—Veeder Mfg. Co., Hartford, Conn.

- 43—Hartford Rubber Works Co., Hartford, Conn.
 44—Continental Caoutchouc Co., 1790 Broadway, New York.
 45—G & J Tire Co., New York.
 46—Morgan & Wright, New York.
 47—Gray & Davis, Amesbury, Mass.
 48—B. F. Goodrich Co., Akron, Ohio.
 49—B. F. Goodrich Co., Akron, Ohio.
 49—C. F. Splittdorf, 265 Walton Ave., New York.
 50—National Tube Co., Pittsburg, Pa.
 51—Goodyear Tire and Rubber Co., Akron, Ohio.
 52—Goodyear Tire and Rubber Co., Akron, Ohio.
 53—Herz & Co., New York.
 54—Diamond Chain and Mfg. Co., Indianapolis, Ind.
 55—Wm. Cramp & Sons Ship & Eng. Bldg Co., Philadelphia, Pa.
 56—Vesta Accumulator Co., Chicago.
 57—J. H. Williams Co., Brooklyn, N. Y.
 58—A. W. Harris Oil Co., Providence, R. I.
 59—Hartford Suspension Co., Jersey City, N. J.
 60—Hartford Suspension Co., Jersey City, N. J.
 61—Baldwin Chain and Mfg. Co., Worcester, Mass.
 62—Continental Motor Mfg. Co., Muskegon, Mich.
 63—Spicer Mfg. Co., Plainfield, N. J.
 64—Pittsfield Spark Coil Co., Dalton, Mass.
 65—Brown-Lipe Gear Co., Syracuse, N. Y.
 66—Feston-Mott Co., Flint, Mich.
 67—Firestone Tire and Rubber Co., Akron, Ohio.
 68—Firestone Tire and Rubber Co., Akron, Ohio.
 69a—Royal Equipment Co., Bridgeport, Conn.
 69b—Electric Storage Battery Co., Philadelphia, Pa.
 70—Oliver Mfg. Co., Chicago.
 71—S. F. Bowser & Co., Fort Wayne, Ind.
 72—S. F. Bowser & Co., Fort Wayne, Ind.
 73—Edmunds & Jones Mfg. Co., Detroit, Mich.
 74—Kokomo Electric Co., Kokomo, Ind.
 75—Byrne, Kingston & Co., Kokomo, Ind.
 76a—U. S. Light & Heating Co., New York.
 76—Stromberg Motor Devices Co., Chicago.
COLISEUM ANNEX, SECOND FLOOR.
 77—Isaac G. Johnson & Co., New York.
 78—Dean Electric Co., Elyria, Ohio.
 79—Gabriel Horn Mfg. Co., Cleveland, Ohio.
 80—A. O. Smith Co., Milwaukee, Wis.
 81—Voorhees Rubber Co., Jersey City, N. J.
 82—Auto Parts Mfg. Co., Muncie, Ind.
 83—Eisemann Magneto Co., New York.
 84—W. H. Leland & Co., Worcester, Mass.
 85—Muncie Gear Works, Muncie, Ind.
 86—Leather Tire Goods Co., Niagara Falls, N. Y.
 87—American Circular Loom Co., Boston, Mass.
 88—Covert Motor Vehicle Co., Lockport, N. Y.
 89—Link-Belt Co., Indianapolis, Ind.
 90—Gemmer Mfg. Co., Detroit, Mich.
 91—Havoline Oil Co., New York.
 92—Champion Ignition Co., Flint, Mich.
 93—Detroit Electric Appliance Co., Detroit, Mich.
 94—Auburn Auto Pump Co., Boston, Mass.
 95—Heinze Electric Co., Lowell, Mass.
 96—Booth Demountable Rim Co., Cleveland, Ohio.
 97—Lovell-McConnell Mfg. Co., Newark, N. J.
 98—Apple Electric Co., Dayton, O.
 99—Bosch Magneto Co., New York.
 100—Sparks-Withington Co., Jackson, Mich.
 101—Lee Tire & Rubber Co., Conshohocken, Pa.
 102—Warner Mfg. Co., Toledo, Ohio.
 103—Turner Brass Works, Sycamore, Ill.
 104—National Coil Co., Lansing, Mich.
 105—Ross Gear & Tool Co., Lafayette, Ind.
 106—Edison Storage Battery Co., West Orange, N. J.
 107—Federal Rubber Co., Cudahy, Wis.
 108—Stewart & Clark Mfg. Co., Chicago.
 109—Empire Tire Co., Trenton, N. J.
 110—Bude Co., Harvey, Ill.
 111—Stutz Auto Parts Co., Indianapolis, Ind.
 112—United Rim Co., Akron, Ohio.
 113—Briggs & Stratton Co., Milwaukee, Wis.
 114—George A. Haws, New York.
 115—General Electric Co., Schenectady, N. Y.
 116—Jacobson & Brandlow, Pittsfield, Mass.
 117—Dorain Remountable Rim Co., New York.
 118—Waukesha Motor Co., Waukesha, Wis.
 119—International Acheson Graphite Co., Niagara Falls, N. Y.
 120—Esterline Co., Lafayette, Ind.
 121—Falls Machine Co., Sheboygan Falls, Wis.
 122—Simms Magneto, New York.
 123—Western Motor Co., Marion, Ind.
 124—Warner Instrument Co., Beloit, Wis.
 125—Valentine & Co., New York.
 126—Batavia Rubber Co., Batavia, N. Y.
 127—Gray-Hawley Mfg. Co., Detroit, Mich.
 128—Avery Portable Lighting Co., Milwaukee, Wis.
 129—J. H. Sager Co., Rochester, N. Y.
 130—Jos. Dixon Crucible Co., Jersey City, N. J.

- 131—Globe Machine and Stamping Co., Cleveland, Ohio.
 132—Adam Cook's Sons, New York.
 133—Hoffecker Co., Boston, Mass.
 134—C. Cowles & Co., New Haven, Conn.
 135—Columbia Lubricants Co., New York.
 136—C. A. Shaler Co., Waupun, Wis.
 137—Pantasote Co., New York.
 138—Sprague Umbrella Co., Norwalk, Conn.
 139—Continental Rubber Works, Erie, Pa.
 140—Start-Lite Co., Chicago.
 141—Universal Tire Protector Co., Angola, Ind.
 142—Auto Supply Mfg. Co., Brooklyn, N. Y.
 143—Double Fabric Tire Co., Auburn, Ind.
 144—Hess Spring and Axle Co., Carthage, O.
 145—Dochler Die Casting, Brooklyn, N. Y.
 146—G. Piel Co., Long Island City, N. Y.
 147—Universal Wind Shield Co., Chicago.
 148—Wolverine Lubricating Co., New York.
 149—Allen Auto Specialty Co., New York.
 150—Willard Storage Battery Co., Cleveland.
 151—Kellogg Mfg. Co., Rochester, N. Y.
 152—Western Tool & Forge Co., Brackenridge, Pa.
 153—Dover Stamping & Mfg. Co., Cambridge.
 154—Stein Double Cushion Tire Co., Akron.
 155—McCue Co., Hartford, Conn.
- FIRST REGIMENT ARMORY GALLERY.**
 2—Atlas Chain Co., Brooklyn, N. Y.
 3—C. O. Tingley & Co., Rahway, N. J.
 4—Barco Brass and Joint Co., Chicago.
 5—Detroit Lubricator Co., Detroit, Mich.
 6—Perfection Spring Co., Cleveland, O.
 7—U. S. Ball Bearing Mfg. Co., Oak Park, Illinois.
 8—Lefever Arms Co., Syracuse, N. Y.
 9—Eagle Co., Newark, N. J.
 10—Mayo Mfg. Co., Chicago.
 11—C. M. B. Wrench Co., Syracuse, N. Y.
 13—Rhineland Machine Works Co., N. Y.
 14—Automatic Motor and Engineering Co., Chicago.
 15—International Metal Polish Co., Indianapolis, Ind.
 16—National Motor Supply Co., Cleveland, O.
 17—Wisconsin Motor Mfg. Co., Milwaukee.
 18—S. Hoffnung & Co., New York.
 19—Flindersen & Kropp Mfg. Co., Chicago.
 20—Brown Co., Syracuse, N. Y.
 21a—Selbach Rubber Co., Boston, Mass.
 21b—Martel Blow-Out Protector Co., Chicago.
 22—Sheldon Axle Co., Wilkes-Barre, Pa.
 23—Peck Wheel Co., Chicago.
 24—S. Breakstone, Chicago.
 25—K-W Ignition Co., Cleveland, O.
 26—Perfect Windo Regulator Co., New York.
 27—E. Edelman & Co., Chicago.
 28—Standard Varnish Works, Chicago.
 29—Keystone Lubricating Co., Chicago.
 31—Frank Mossberg Co., Attleboro, Mass.
 32—Norton Grinding Co., Worcester, Mass.
 33—Morrison-Ricker Mfg. Co., Grinnell, Ia.
 34—Chilton Company, Philadelphia, Pa.
 35—Class Journal Co., Motor Age.
 36—Longdin & Brugger Co., Fond du Lac.
 37—Troy Carriage Sun Shade Co., Troy, O.
 38—Model Gas Engine Co., Peru, Ind.
 39—Shawmut Tire Co., Boston, Mass.
 40—Class Journal Co., Automobile.

TAXICAB STRIKE IN LONDON

London, Nov. 3—Just at the opening of the Olympia exhibition a dispute has arisen between the taxicab drivers of London and the owners, and today only 1,000 of the 7,000 cabs are in operation. The dispute is in regard to the action of the federated owners in demanding payment of the drivers for the extras, which has been resented by the drivers, who ceased work yesterday.

At the present time the drivers are remunerated by a percentage on the takings, being entitled to take 25 per cent of the amount shown on the taximeter. According to the police regulations, the charge for taximeter cabs is 16 cents per mile, with an additional 12 cents for each passenger over three per journey, and 4 cents each for packages carried on the footboard. The drivers are supposed to punch up these extras on the taximeter at the time of hiring; however, they have not been in the habit of doing this, and recently the federated owners put on a number of inspectors, with a view to reporting the drivers who were earning extra money which was not charged up on the taximeter.

England Entertains Yankee Engineers

LONDON, Nov. 8—The visiting members of the Society of Automobile Engineers arrived here at 1 o'clock yesterday. The members should have disembarked at Fishguard, but owing to the rough weather the Mauretania had to proceed to Liverpool, so that instead of arriving on Monday night it was yesterday noon before our visitors reached here.

The headquarters of the society in England is the St. Ermins hotel, Westminster, and a meeting of the members was held there this morning, under the presidency of H. F. Donaldson. It was attended by B. Joy, secretary of the Institution of Automobile Engineers of England, T. B. Browne and J. S. Critchley, vice-presidents.

Those in the American party are:

Howard E. Coffin, Detroit, Mich.; W. G. Wall, Indianapolis, Ind.; H. F. Donaldson, New York; Coker F. Clarkson, New York; Walter C. Baker, Cleveland, O.; J. S. Bretz, New York; Albert Champion, Flint, Mich.; H. D. Church, Detroit, Mich.; John A. Crowley, New York; Arthur B. Cumner, Philadelphia, Pa.; E. A. DeWaters, Flint, Mich.; F. S. Dusenbery, Des Moines, Ia.; Burton G. Ellis, Boston, Mass.; C. H. Foster, Cleveland, O.; H. Jay Hayes, Detroit, Mich.; J. B. Hull, Cleveland, O.; William Kelly, Detroit, Mich.; George W. Kerr, Chicopee Falls, Mass.; Hugh Kerr-Thomas, Buffalo, N. Y.; Charles B. King, Detroit, Mich.; W. P. King, Cleveland, O.; Robert McA. Lloyd, Long Island City, N. Y.; D. G. McDiarmid, Chicago; Alden L. McMurtry, New York city; Carl J. Metzger, Ottawa, Ill.; William E. Metzger, Detroit, Mich.; Charles D. J. Moore, Detroit, Mich.; Bert Morley, Detroit, Mich.; C. S. Mott, Flint, Mich.; Ralph H. Rosenberg, Columbus, O.; A. J. Slade, New York; C. O. Snyder, Chillicothe, O.; Paul L. Snutsel, New York; H. C. Stutz, Indianapolis, Ind.; H. T. Thomas, Lansing, Mich.; G. R. Wadsworth, Cleveland, O.; G. A. Wahlgreen, Denver, Colo.; Henry G. Wilson, New York; John G. Wood, Indianapolis, Ind.; B. B. Bachman, Ardmore, Pa.; Robert T. Hendrickson, Fremont, O.; T. R. Thomas, Racine, Wis.

Various matters in connection with the tour were discussed, and the general program ratified as follows: Thursday morning a visit will be paid to the Walthamstow works of the London General Omnibus Co., and in the afternoon a party will be conducted to the South Kensington museum. Friday's arrangements provide for an afternoon's visit to the National physical laboratory at Teddington, and on Saturday morning a visit of inspection will be paid to the W & G taxi depot at Acton Vale, W. In the evening the visitors and other friends will be entertained at dinner by the Institution of Automobile Engineers at the Trocadero restaurant.

Program for Week

On Sunday P. L. D. Perry, of the Ford company, has arranged for a number of Ford cars to give the visitors an outing, during which they will visit the Brooklands racing track. On Monday the 13th a round of visits will commence per London and North Western Railway. In the forenoon the Humber factory at Coventry, which has estimated facilities for 100 chassis and 2,000 cycles and motoreycles per week, will be inspected, and also the machinery tool works of Alfred Herbert, Ltd. The party will spend the evening at Coventry and on Tuesday will visit the

Daimler factory in the forenoon. A visit will then be paid to the Rudge-Whitworth factory, where demonstrations will be given with the R. W. wire and other wheels. The works of the Coventry Chain Co. also will be available for inspection, and the party then will pass the night at Birmingham. On Wednesday the visitors will inspect the factory of the Wolseley Tool and Motor Car Co., and on Thursday will proceed to Manchester, via Wolverhampton, visiting at the latter place the Sunbeam Motor Co.'s works. In Manchester the Renold chain works will be visited and the return to London made on Friday night, which will conclude the British part of the program. The visitors then will leave for Paris on Saturday, and on Monday the 20th will visit the Panhard factory and other motor works.

A fleet of vehicles belonging to the Daimler hiring department was in attendance at Euston station to convey the members to their quarters, otherwise difficulties would have occurred, owing to the fact that the means of transportation by taxicabs in London at the present time is practically non-existent. After arriving at the headquarters a large number of the visitors made for the Olympia show.

Tonight Howard Coffin delivered a lecture, which was largely attended by members of the English institution. The title of Mr. Coffin's paper was "Chassis Design."

Howard Coffin's Speech

In part Mr. Coffin's speech was as follows:

I must confess to a feeling little short of awe at the amount of use, misuse and abuse which can be withstood by a motor car in the hands of the average American user. Except for certain structural features affecting road or ground clearance, I do not see why the American chassis should perform better than the English—due consideration being had, of course, for the relations of power, weight and road condition.

A comparison of the engineering practice entering into the better class of American cars does not show any greater degree of uniformity than is to be found in the similar class of English cars. Various spring suspensions are to be found; single and double-jointed cardan shafts are in evidence; some rear constructions are fitted with a torque-absorbing member and some are not; the drive of the road wheels is transmitted to the main frame through the springs, through radius rods or through a tubular housing for the propeller or cardan shaft, etc., as may suit the whim, the pet theory or the necessities of the individual designer. Whatever the dictates of theory, these varied constructions seem, when well made, to perform in an equally satisfactory way, or at least in a commercially satisfactory way. There are some peculiarities in American chassis design. Some serve an engineering purpose; some meet a commercial demand; others would seem to be without excuse.

High-powered motors are a necessity, first, because of the excess of brute power required to negotiate the poorer class of roads at speed; and, second, because of the antipathy of the average American towards the use of the gear-shift lever.

As nearly as can be judged at the moment, the coming of the long stroke will mean no lessening of bores—merely an increase in powers. A six-cylinder car, for instance, formerly 5 by 5½ inches in bore and stroke will for this year be 5 by 7. Four-inch engines are moving up from 4 by 4½ to 4 by 5½ and even 4 by 6, with no very great changes otherwise in the chassis or weight of the finished car. The low price of fuel and the low rate of or

H. E. Coffin Talks on Chassis Design

total absence of horsepower taxation tend to encourage rather than discourage this advance in power. A broad statement may almost be made, that no American car above the smallest two-seater will carry a four-cylinder motor of less than 4-inch bore. One or two instances, such as the Hupmobile, may be said to be the exceptions which prove the rule.

Location of Brakes

Another peculiarity often remarked by those from this side of the water is the brake location. Double brakes upon the rear wheels have become an almost universal practice. Almost every argument in the category can be cited in favor of the cardan shaft service brake. European precedent is a unit for it. Considerations of weight, cleanliness, freedom from grit and wear, ease of adjustment, ease of operation, simplicity of operating mechanism, the equality of the retarding action upon the rear wheels—all favor it.

But early in the making of American motor car history the engineers of two or three of our leading makers found it impossible or inadvisable for structural reasons to fit cardan shaft brakes. Thus early began a campaign of publicity and of education for the double rear wheel brake. Many engineers favor the cardan, but the buyer wants the rear wheel type and the manufacturer builds the car to suit the buyer. It is really as simple as A. B. C.

The character of American roads and the conditions under which American cars are forced to perform have had necessarily a great influence upon the direction of detail development. Road clearances, spring lengths and spring clearances, the avoidance of extreme lengths in wheelbase, precautionary measures against squeaks and rattles through leather and rubber liners, bronze bushings, numerous grease cups, etc., the deep ribbing or beading of all sheet-metal surfaces for the prevention of vibration, the secure locking of every bolt and nut in its place, these and a hundred and one other of the things are being given a particular attention because of the nature of the service to be encountered at the hands of the American user.

American cars, and hence American standards of motor engineering were for years regarded as somewhat of a joke upon this side of the water. But because American design differs from those principles which have been found to succeed in Europe, it must not be assumed that the American designer is ignorant as to the trend of practice upon this side of the water. The light, high-speed, small-bore motor of 12 to 15 horsepower would perform admirably upon the English-like roads of New England, but would fail miserably in the face of the hub deep, sticky gumbo of some sections of the middle west.

Ample road clearance is an absolute necessity upon any car which is built in quantity to meet a nation-wide market in the states. Among the visiting contingent in this audience I can note the faces of some of those who with me years ago joined the "Sadder but Wiser Club" as regards this subject. Hence larger wheels, greater axle and flywheel ground clearance, and a generally somewhat higher car appearance than is usual upon this side.

Now let me turn to some of the matters which I believe may be of more interest to you as indicative of new departures, or new trends in design and construction. Few cars of any power or price will go into the next season without self-starting motors. Several are already fitting starters as regular equipment for this season, and many others are following suit.

Next the lighting problem. Six months ago it looked like a walkaway for the electric generating outfit. The ability to turn lights on and off at will—the ability to relight the lamps with the snap of one's fingers at the wind and at that last remaining match in one's pocket—all these things appealed wonderfully.

But the fears of electric competition have brought gas lamp improvements, whereby one may, with a single switch turning movement from the seat, turn on and light the acetylene gas lamps. The use of the acetylene self-starter also would seem to argue well for the retention of the gas light in combination.

The long-stroke motor I already have touched upon. As to en bloc castings and the protection of working parts, I do not believe that the newer American cars will be found to differ greatly from European practice.

I already have mentioned one or two chassis peculiarities, double rear wheel brakes, etc. To these I might add the frequent positioning of the gear box upon the rear axle member. I presume that the arguments pro and con upon this subject are much the same with you as with us—weight and tire wear upon one side and gear quietness with manufacturing and repair advantages upon the other.

Of course no engineering discussion would just now be complete without some mention

of special motor valves. The Knight motor you know. It is now being adopted by four makers in the states, and apparently with success. There are several American valve mechanisms which seem to promise well. Every one is of the rotary disk or rotary valve type. It seems to be the American creed that if the poppet valve is to be dropped, it would be a mistake to replace it with another reciprocating mechanism—sleeve or otherwise. Hence a concentration upon that type of valve action which may be accomplished by a mechanism free from reciprocating parts.

It is not to be expected that the coming annual show in January in New York will bring out any marked change in clutch construction. The cone probably will show a percentage of increase, not because the disk and other types are being abandoned, but because a larger number of the newer and cheaper models will carry the cone as the cheapest form of the reasonably satisfactory clutch. There is one form of clutch coming into use in the states, which is, I believe, entirely unknown upon this side of the water. I refer to the multiple-disk form using cork for the friction surface. I will make the broad statement that the properly constructed cork-surfaced clutch will distance all others in smoothness of action, length of service and freedom from trouble both in the factory and upon the road. A flushing out with kerosene, perhaps once a month followed by the addition to the case of 1/2 pint of mixture of kerosene and ordinary thin gas engine oil will keep the action perfect no matter what the temperature or weather condition.

Power tire pumps are being fitted to many of the higher and medium priced cars—the demountable rim may be said to be becoming almost the regular equipment of all but the very cheapest machines.

There is a marked tendency toward the use of roller bearings of which several makes are well known in the states. Used in connection with gearing, they give a quieter effect—or at least some makes of them do—and the load-carrying capacity is considerably in excess of the ball bearing of equal diameters. The roller bearing bids fair to replace the ball for all heavy truck work.

Quietness is Demanded

Extreme quietness is just as much in demand with us as with you. This demand is being carried to foolish extremes in some instances—but its net result is undoubtedly good for the industry. Valve mechanisms are being enclosed and better gear work and fitting done. The worm final drive is receiving a good deal of attention, although not nearly so much as yet as here in England.

Sheet metal, both aluminum and steel, has come to be the universal, or nearly universal, practice for all body panels. The quantity production of bodies has brought about some wonderful press and die work for the forming of entire front and rear seat panels from one sheet of metal. One concern, the Pierce, is notable for its bodies of cast aluminum seat back and panel construction.

Demountable wheels—wood—have been for several years fitted as regular equipment by one of our American makers. It does not seem probable that this practice will spread. Wire wheels have lost favor and in 1903 and 1904 when the good public made up its mind in favor of wooden spokes American manufacturers were forced to scrap thousands of sets of wire equipment because the turn of the tide came so suddenly. The objection to wire is one of appearance and I doubt whether the American buyer can be soon brought to favor the lighter and stronger type. Educational work is wonderfully expensive and American makers are not apt to push it.

In one great thing our American engineers have been particularly fortunate. I refer to the number, the variety and the character of the motor car contests which have been held in every part of the country and under every possible condition of road and climate. There can be no better school of design than the racing camp during the 2 weeks' practice period just before some big 200 or 300-mile road race. But here, as in every other line, a definite system must be followed if the best returns in an engineering as well as a publicity way are to be had.

Many American makers have spent considerable annually in the maintenance of contest crews. The cars entered in the racing and endurance events have for several years been generally stock cars. Even the special cars entered in the open or so-called non-stock events have been made up largely from the standard parts used in regular production.

The advantages accruing to the engineer from such a practice are too obvious to need emphasis. A not unusual method of procedure is to place the chief engineer either directly in charge of the contest work or at least in close working contact with contest crew management. A crew is more than frequently made up of a business manager and from two to

three cars with drivers and mechanics. If the engineer is wise he will have placed upon his desk an almost daily detailed report of the performance and troubles of these contest cars. I don't know of a more searching trial of steering connections, wheels, motors and, in short, of the entire driving mechanism than is the 300-mile road race or the 2,000-mile endurance run covering every possible road condition.

The encouragement of the stock car contest has been of unusual value to the engineer and hence to the progress of the industry in the states. Not only has the American engineer been constantly able to judge of the performance of standard cars under severe service conditions, but he has been no less the gainer in that he has had his whole attention riveted upon a bread and butter model, as we say, rather than upon some monster racing car. All of you know how the production of a racing car disrupts a factory organization.

Just now we are hearing much over here of another thing—the American invasion of the English market. There seems to be a good deal of worry, at least upon the part of the press. Whether this is because the press does or does not own motor car stocks—shares you call them—I do not know. If the press does not, then I do know that it has been spared many headaches.

No Fear of Invasion

I don't quite see why England fears an invasion. The invasion is of the cheap car, I believe it is called. If the cheap car has a field in England, the probabilities are that it is a field to which you have not yourselves catered. It seems to me that you may meet the issue either by building low-priced cars yourselves for this demand or by keeping out of this field and sticking to the class of product to which your preferences and your methods incline you.

We have been through the same thing in America exactly. The production of the \$500 car by Ford was croaked to be the death knell of all high price getting. There have been several death knells since Ford, and Ford himself is still at it to the tune of 75,000 cars for 1912.

FALL SHOW IN INDIANAPOLIS

Indianapolis, Ind., Nov. 20—Members of the Indianapolis Automobile Trade Association are holding their first fall show this week. Heretofore the annual shows have been in the spring, usually in March or April. It has been thought best, however, to hold the shows nearer the beginning of the season.

Indianapolis has held similar shows in the past and each and every one has proven a success. This is the same scheme as was put on in Chicago a month ago.

Each member is exhibiting in his own place of business and the different sales rooms are beautifully decorated for the week. A special feature is a free bus service for taking visitors from one sales room to another. There are forty-three cars in this service for the week, loaned by members of the association. Each dealer has an ample supply of tickets. Dealers from all parts of the state have been invited to attend the show. The Buick Motor Co. will entertain all of its Indiana agents during the week.

Thursday afternoon has been selected as ladies' day and during the afternoon special attention will be given to the display of electrics, coupes, limousines and other closed body cars. All of the sales rooms are beautifully decorated with flowers and greens and in many arrangements have been made for harpists or orchestras. The Premier Sales Co. will exhibit a desert scene, showing the Premier schooner as it appeared while crossing the desert in the Premier ocean-to-ocean run. This scene is the same the company had during its recent fall opening.

Olympia the Motor Mart of the World

First Week of English Show Proves a Record-Breaker, More Than 250,000 Crowding Through the Doors—Foreign Visitors Include Many Notables—French Commend the Big Motor Car Display

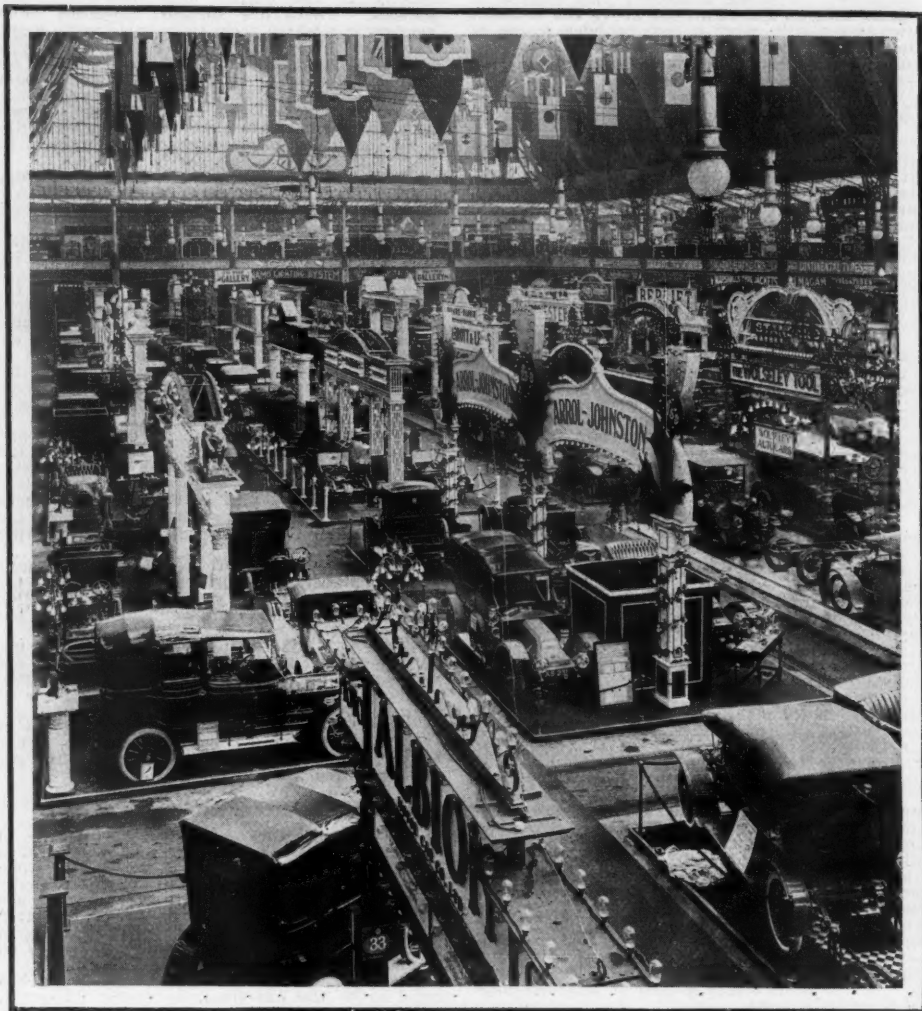
By J. S. Critchley

LONDON, Nov. 11—During the week the show has been open some 250,000 visitors have passed into the halls of Olympia, and as far as attendance is concerned, a record has been achieved; unfortunately the greater the crowd the greater the inconvenience to those who are desirous of seeing the exhibits, and it will be certainly necessary in the future to make arrangements either by an increased charge, or lengthening the days of the show, to enable those really interested to properly view the exhibits.

Never before at a motor show have so many foreign visitors crowded together. All the leaders of the motor car movement in Europe have been present, and these, together with our own engineers and business men and a representative gathering of technical experts from the United States, have made the show of 1911 one of more than ordinary interest. The mention of some who have been present may be interesting, they are: Paul Panhard, Chevalier Rene de Knyff, Marquis de Dion, Armand and Robert Peugeot, Alexandre Darracq, Adolphe Clement, Baron de Turekheim, Duc d'Uzes, Georges Richard, Louis Delage, Rettel, M. Dombret, M. Desgouttes, Louis Renault, M. Rougier, Baron Petiet, M. Hinstin, Lucien Faure, and Henri Brasier.

Views of French Visitors

For many years there was considerable rivalry between the London and Paris shows, but there is no doubt now that owing to the short-sighted policy of the French manufacturers in abandoning their show, the center of gravity has been moved to London. The French manufacturers closed their show because they declared that it did not improve their business; they now discover what a blunder they have made, which is shown by the diminution in their export trade. The British manufacturers have had to meet the world's competition, and they have not taken a second place. Buyers all over the world have come to regard London as the hub of motoring, and Olympia stands pre-eminent as the only exhibition of a really international character. Year by year the Olympia show has increased in importance and magnitude. The expres-



GENERAL VIEW OF THE ENGLISH SHOW

sions of the French critics on the show are quite interesting.

Charles Faroux, writing in *L'Auto*, regrets that the Paris show has been abandoned, and expresses doubt as to the wisdom of the French manufacturers in taking part in a London show after having denounced the principle of an annual exhibition. He says:

"I will not call it a triumph of the English industry, but it is a triumph of the English commercial spirit. We have declared that in motor matters no nation had the skill of the French, therefore the buying public would remain true to us. This affirmation is a double error. Firstly, it is an error of deduction. The buying public, in general, is not a connoisseur of motor cars; the question of the superiority of a chassis therefore becomes a secondary one, and from a business standpoint it is more important to make yourself known than to know how to build.

"Imagine the number of possible buyers scattered throughout the Argentine, Canada, Australia, Japan. For years they have read that France was the center of motor sport, that Paris had a big show, the

only one, a unique one—and that the French chassis was the best. At present everybody is talking of London, and the French names have disappeared. The result is that England, America, Germany, Italy and all the countries have increased their exports. France alone has gone back. We are still making excellent cars, superior cars, indeed, but it is not known.

Error in Reasoning

"Secondly, there is an error in the starting point of our reasoning. It is true that on the whole French motor car construction is the finest in the world, but it is not correct to imagine that the English are separated from us by the same interval as in 1907 and 1908. They have made considerable progress, and in later articles I will prove it. Today it is a question of regaining lost ground. There is a fine work to be done, and I am certain that our leaders can accomplish it; but they must not hide from themselves the fact that the task will be difficult."

Examining the show from a technical standpoint, M. Faroux declares:

"Among the English we find improvements of a practical nature; on the French

cars we have technical progress. It is not a question of engineers, for a number of English research departments are under the control of French engineers. It is a question of the customer. The English owner who cannot indulge in speed, by reason of ultra-severe regulations, is more concerned with comfort and commodity. I consider that the French progress is in itself superior to that of the English; but it must not be forgotten that the English ameliorations remove many of the difficulties that the salesman has to deal with. Cannot we unite the two?

In "L'Aero" M. Fafotte writes: "We must not attempt to make any comparison between the London show and the exhibition we have been accustomed to see in the Grand Palais. This, however, does not rob the London show of any of its interest. It is not a reduction of the Paris exhibition, but it is an excellent business center. An interesting feature is the inclined platform allowing cars and chassis to be discharged easily, and making it unnecessary to bring carts and trucks into the hall. The luminous sign, with the name of the exhibitor in each aisle, is another innovation. The decorations are more startling than graceful. M. Rives would flee from them, and M. Granet will not find any inspiration in them."

For the first time since the inauguration

of the annual show the coachbuilders form a separate and complete section by themselves. This new section is practically comprised of a display of members of the Institute of British Carriage Manufacturers, an organization which includes firms of the highest reputation in the art of carriage building. Membership of this association is held in high regard by firms whose reputation qualifies them for membership. This institute has done good work in promoting the science of coachbuilding to keep pace with the changes brought about by the new form of locomotion.

Some of the Body Styles

Great attention has been given to the closed car problem, and this type is probably more improved in proportion than any other type during the past 12 months. More graceful lines are being evolved, in which no doubt the torpedo type has had much influence. Undoubtedly the fashionable design for this class of body is that of the flush sided type. Many closed bodies are being designated the torpedo limousine and torpedo landaulet. Double purpose bodies, which can be entirely closed or open, show that a great amount of time has been spent and experimental work has been done during the past 12 months. A body of this type which can be used as an entirely open carriage re-

quires more than ordinary skill, and can never be put together at a low price. It is comparatively simple to make a superstructure which does not rattle or get out of order, but it is extremely difficult to make one which can be opened or closed like a cape hood. The Pullman type of body, which in many cases has only two doors, is becoming quite a popular type for owner drivers. Many of this type are fitted with armchair seats, which can be raised, lowered or tilted, as desire may wish.

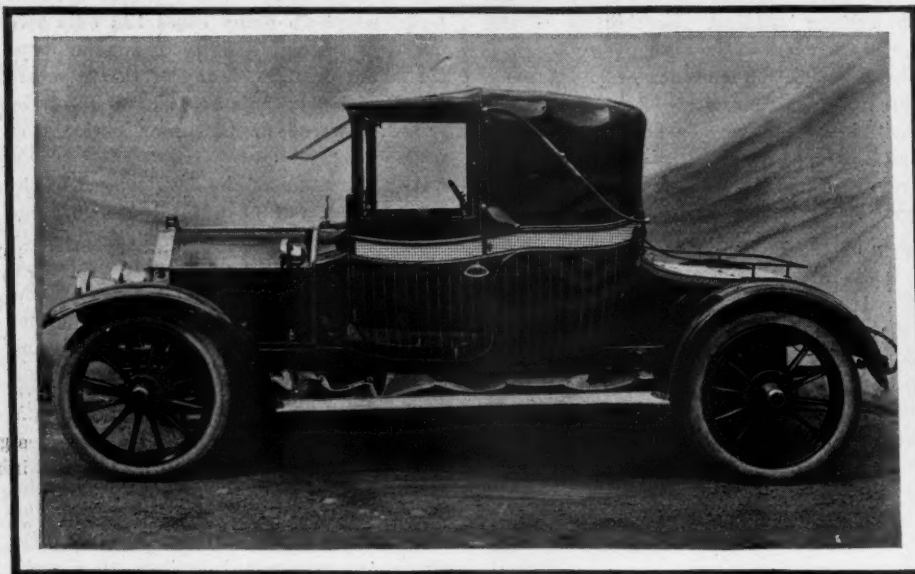
As an instance of the development of the covered car, out of a total of 370 large cars exhibited at the show, no fewer than 354 are fitted with detachable or permanent covers. The employment of the scuttle dash has given the coach-builder much greater scope for design, and although in some instances one sees handsome cars which are in a measure spoiled by the bluntness at the dash board end, on the other hand the majority of designs show a great amount of skill in combining the bonnet with the carriage work, and scuttle dashes and high sides are everywhere the recognized feature of a well-designed carriage; this has enabled the carriage designer to evolve lines from back to front which are in perfect harmony.

It is quite an exception to find bodies built with a view to accommodate luggage

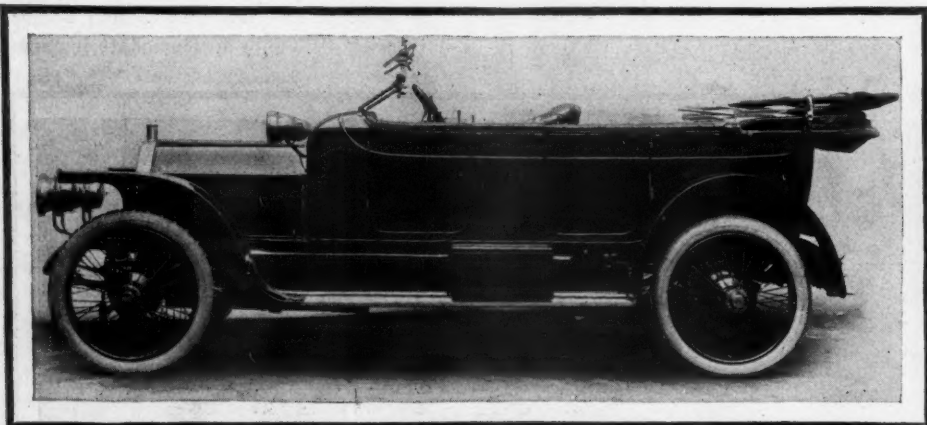


AS OLYMPIA LOOKED TO MEMBERS OF THE SOCIETY OF AUTOMOBILE ENGINEERS

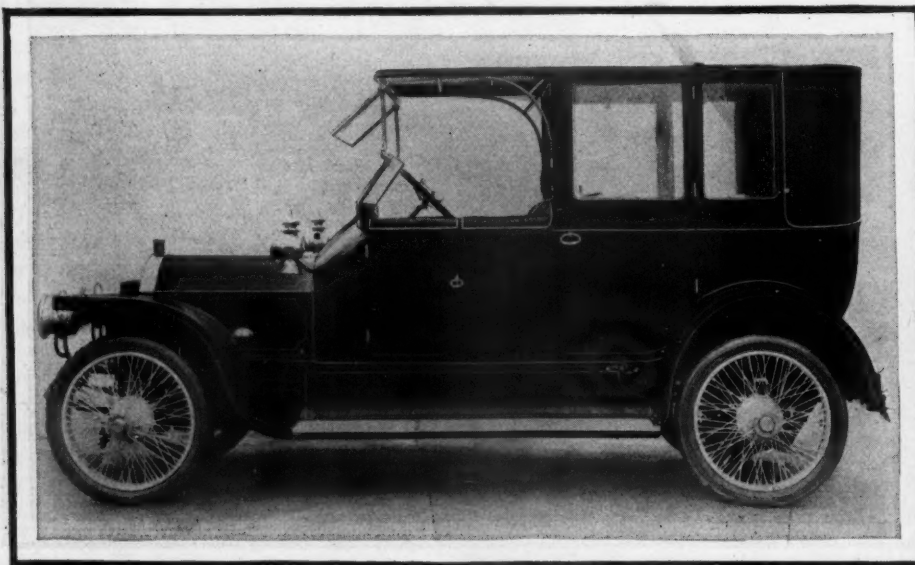
Latest Ideas in Body Styles



TWO-SEATED CABRIOLET, A SALMON IDEA



TORPEDO BODY FITTED TO 15-HORSEPOWER NAPIER



LANDAULET ON 15-HORSEPOWER NAPIER CHASSIS

or servants. The Austin Windsor limousine is, however, an exception. With this limousine the inside seats are placed further forward than is the usual practice, the edge of the seat being about level with the hinge of the door; this leaves considerable space at the back of these seats, some 18 inches, in which luggage can be placed. The entrance to this back department is obtained from a door in the rear, two folding seats are fitted, one on either side, so that not only the luggage, but servants can be accommodated.

Features of Cars

At the present show the Rolls-Royce company is not showing any chassis. The policy of the firm is still to build only one model, a six-cylinder. The firm's exhibit is arousing more interest even than usual, for the reason that no chassis is exhibited, only cars fully equipped with coach work. The policy of the company is not to bring out any new design at any special part of the year, but to build its cars in batches. Detailed improvements are added as required, or when found to be of service. Instead of allowing full details of its novelties to be published it is desirable that nothing shall become known about them, the argument being that they are not exhibiting for the information and benefit of other manufacturers, but merely to interest purchasers of their vehicles who are not concerned with mechanical details, but who are merely interested in seeing complete examples of motor coaches.

The Vauxhall

The object of the Rolls-Royce company appears to be to produce as few cars as possible, and as a matter of fact it is impossible to get delivery from the works of these models under 6 to 8 months.

There is very little change in the general design of Vauxhall cars, which are made only in two sizes, namely, the 20-horsepower four-cylinder, 90 by 120-millimeter stroke, and the 30-horsepower six-cylinder of the same bore and stroke. The cylinders of the 20 horsepower are cast en bloc, while the cylinders of the six are cast in two blocks of three each. The metal-cone clutches formerly used have been replaced by those of the multiple-disk type, the necessary lubrication being provided in the form of dry graphite. The carbureters are of the float-feed constant-level type, with no spring air-controlled valves.

The lubrication medium is circulated by a plunger pump, driven by the ball-bearing eccentric on the rear end of the camshaft. The pump dips into the filter chamber in the sump and draws up oil, which is forced through the main oil pipe and five branch pipes to the main crankshaft bearings, thence through a hollow crankshaft to the connecting-rod big ends. The entire pump and its valves can be readily

detached. The gauge on the dash indicates the pressure existent in the lubrication circuit and the little metallic tell-tale rises and falls with every stroke of the pump. The consumption of oil is rather less than 1,000 miles per gallon.

A neat feature of the lubrication system is the sludge valve, which provides means for removing from the bottom of the sump any sludge or oil residue without drawing off the oil in the crankcase.

The four-speed gearbox of the four-cylinder car is arranged to give at 1,000 revolutions of the motor the following speeds: First, 7.7; second, 11.7; third, 19, and, fourth, 28 miles per hour.

With the six-cylinder type the speeds are: First, 8.5; second, 13; third, 21, and, fourth, 31 miles per hour, the gear ratio and the back axle being 3.6 to 1 and 3.3 to 1, respectively.

Delaunay-Belleville

One of the chief points in connection with the Delaunay-Belleville cars is the combined jet and surface carburetor. With this carburetor the throttle chamber is placed at a high level, practically that of the valve heads, from which two pipes are led downwards to the float chamber. One of these pipes surrounds the main gasoline jet used when the car is in full load, and the other surrounds the gasoline gas jet, through which vapor or gas passes, but no gasoline in a liquid state.

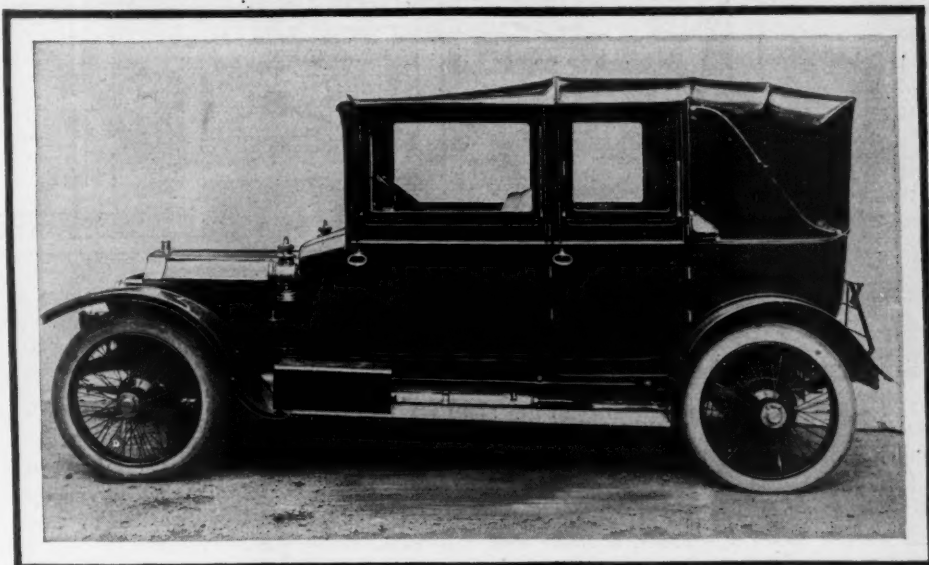
To obtain the gas for this jet the latter is mounted over a small vessel that is an integral part of the float chamber, and in which the gasoline level is regulated by a float. The gasoline in this receptacle gives about 3 square inches of surface over which air is drawn by the suction of the motor, and in passing over the gasoline the air picks up a small amount of it, which is drawn through the inlet pipe by way of a gas jet. The idea of this arrangement is of course that there always shall be a supply of gas, no matter how slowly the engine may be turning or how weak the suction, it being claimed that by this arrangement the supply of gas can be obtained with a suction which would not be sufficient to raise gasoline out of a jet.

New Things on Maudslay

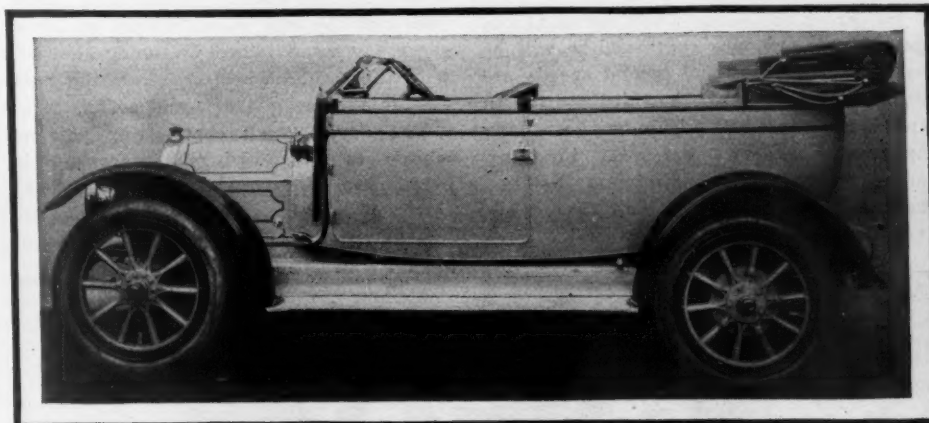
Figs. 5, 6, 1 and 4 show, respectively, gearbox, elevation, plan and rear axle arrangement of the 1912 17-horsepower Maudslay. In some of the details this car remains as last year, but there are two important innovations, namely, a worm-driven axle and a chain-driven gearbox. It is probable that this latter will be of great interest to engineers generally. Therefore the writer will deal with it at some length, and that, too, before proceeding with a description of other parts.

In the gearset, Fig. 5, the drive from the engine is taken by the spherical-sided square coupling shown at A on the right-hand side of the diagram. It will be seen at a glance that there is no direct drive, each of the four speeds being through the medium of a Coventry silent chain. It

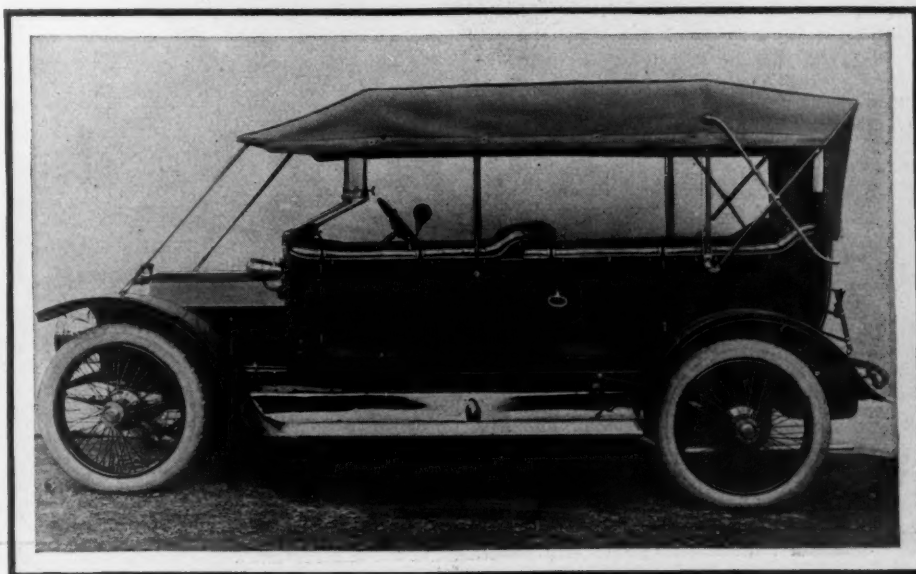
English Show New Types



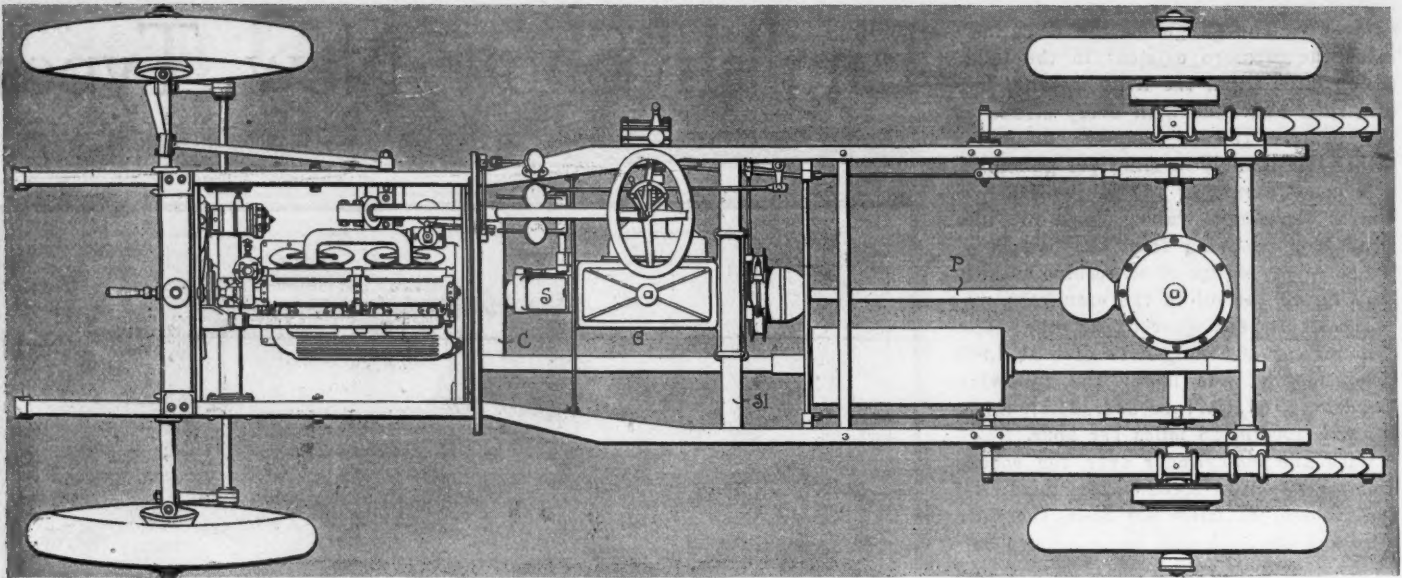
ENCLOSED FLUSH-SIDED CABRIOLET BODY



BODY DESIGNED FOR USE IN ALL KINDS OF WEATHER



TORPEDO TYPE OF BODY DESIGNED BY SALMON



LETTER: U

FIG. 1—PLAN VIEW OF MAUDSLAY WORM-DRIVE CHASSIS

will be observed, by looking for a moment at the chassis elevation, Fig. 6, that the fact of the two chain wheelshafts being placed one below the other, coupled with the fact that there is no direct drive, greatly assists the design in the matter of the positioning of the propeller P and wormshaft W.

So far as the chain wheel ratios of the gearbox, Fig. 5, are concerned it will be seen that the first and second speeds are geared down, and that the third and fourth speeds are geared up. This has been done apparently for two reasons: First, in order to maintain a minimum distance between the two shafts, and that there may be no chain wheel of excessive pitch

diameter—thus introducing compactness; and, second, for the very good reason that by such treatment duplication of parts is possible to some extent. It will be observed that though this box contains eight chain wheels in all, these chain wheels consist of four pairs: the forward wheel B 1 on the top shaft being identical with the rear wheel E 2 on the lower shaft, the second wheel C 1 being identical with the second wheel D 2 from the back end on the lower shaft, and so on.

The dogs, which couple any pair of wheels to the drivingshaft, consist in every case of gear wheels having twenty teeth of eight pitch which engage in internally cut wheels in the bosses of

the respective chain wheels. In fact, the engagements of any speed is in the Maudslay box performed in a manner identical to the system of direct drive engagement of the gear box of standard pattern. The edges of the teeth are, of course, rounded off to facilitate engagement.

It will be interesting next to give some particulars of the dimensions of chain wheels, and, as the wheels on the two shafts are identical—but are mounted in reverse order—it will be sufficient to record those of the primary shaft only.

The first-speed wheel has fifteen teeth and the pitch is $\frac{5}{8}$ inch, the wheel being 2 inches across the face. The second-speed wheel has sixteen teeth and the pitch is $\frac{3}{4}$ inch, the width of the wheel being $1\frac{1}{2}$ inches. The third-speed wheel has twenty teeth of $\frac{3}{4}$ -inch pitch and the teeth are $1\frac{1}{2}$ inches wide. The fourth, and top speed wheel, has twenty-nine teeth of $\frac{5}{8}$ -inch pitch with a tooth width of 2 inches. The reverse is, of course, obtained, without the use of an intermediate wheel, by a couple of gears of $\frac{1}{16}$ -inch pitch and

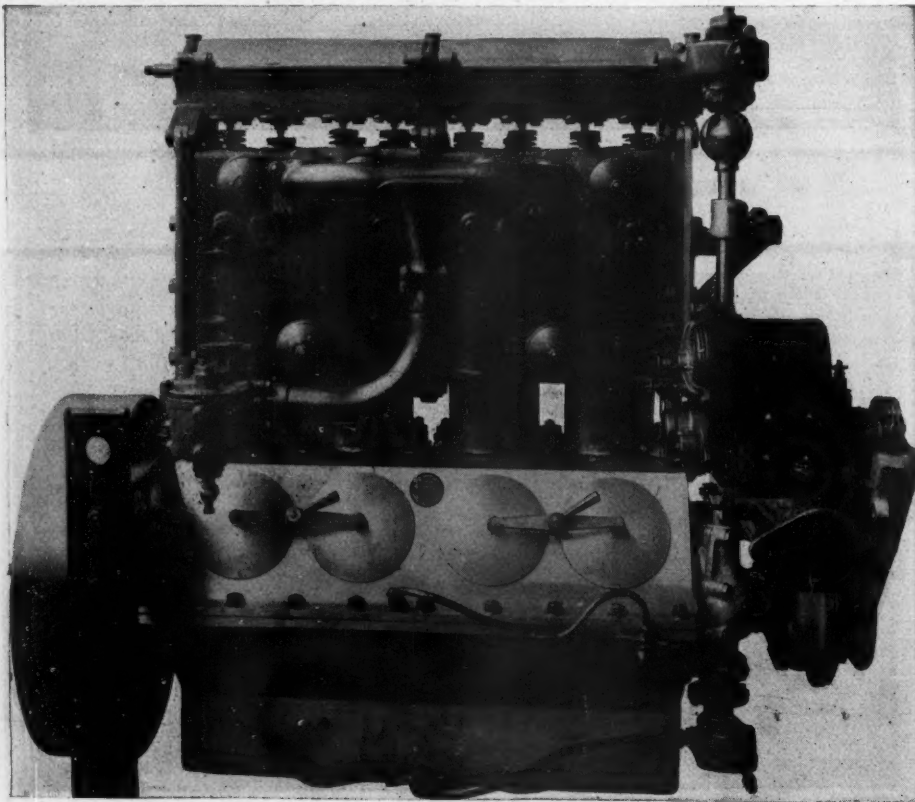


FIG. 2—SIDE ELEVATION OF 17-HORSEPOWER MAUDSLAY

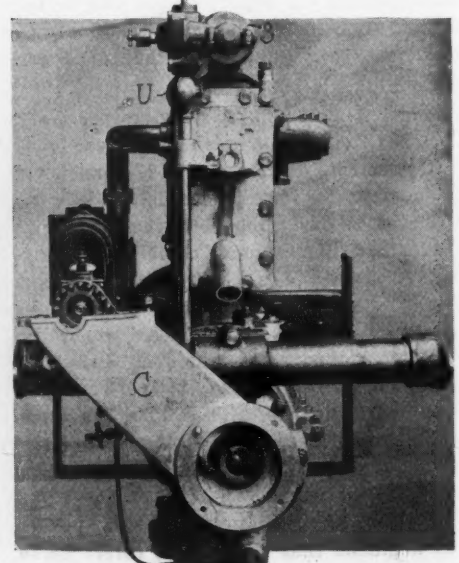


FIG. 3—MAUDSLAY, FRONT ELEVATION

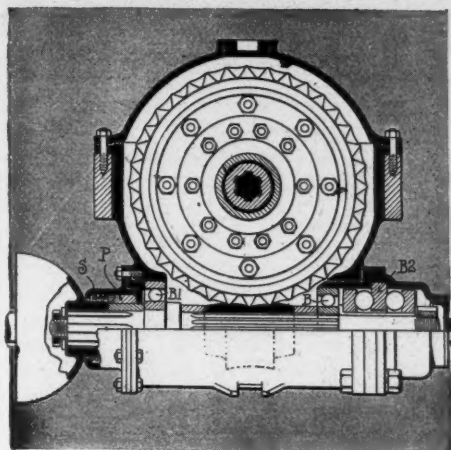


FIG. 4—MAUDSLAY WORM-DRIVE

having twenty-two and forty-two teeth. The smaller wheel is mounted upon the primary shaft and slides upon it so as to be engaged with the larger wheel when required for reversing. This larger wheel is mounted on the tops of the teeth of one of the driving dogs in a manner that strikes one as being a little peculiar, though doubtless quite mechanical.

It will be seen that a steel plate, having notches cut in it to suit the purpose, transmits the motion from one part to the other. Each shaft is provided with three bearings, and the design is such that in each case a pair of chain wheels lies close alongside the bearings; the distance from bearing center to chain wheel center being in no case more than 2 inches. The reverse wheels, it will be seen, take a position betwixt these bearings. Each shaft has a diameter of $1\frac{1}{2}$ inches over the tops of the driving keys. It should be stated that the sleeves upon which the wheels run, when not actually driving, are phosphor bronze. There is no doubt that a box such as described will operate as noiselessly on each of the four speeds as does a box of the more usual gear type on the highest and direct speed only.

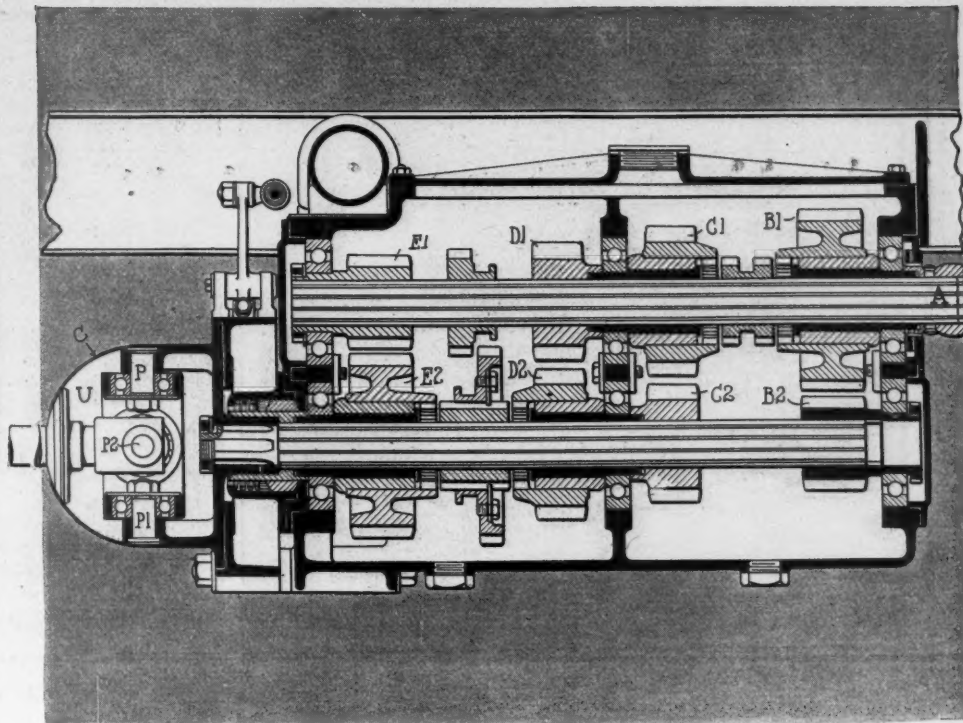


FIG. 5—CHAIN-DRIVEN GEARBOX OF MAUDSLAY

The efficiency of the type of chain employed is an accepted fact and, of course, the chains run in an oil bath so that the lubrication side of the question is well looked after.

Passing back to the universal joint, U, Fig. 5, it will be seen that this is identical with the joint fitted last year, and that it has ball bearing trunnions, P, P1 and P2, and a hemispherical dust-proof casing, C.

The worm-drive rear axle, Fig. 4, next calls for some explanation. The worm is of the Lanchester type; that is, it has a concave tooth form, and the ratio is 6 to 1. It is somewhat surprising to note that the general construction of this worm-driven axle is similar to that of last year—when the drive was by bevel gear. The stout

forged stay—generally circular in shape—which previously was disposed in a vertical plane, now lies, as will be seen by referring to Fig. 4, in a horizontal plane. This is, of course, necessitated by the position of the worm. The cover which also is shown very clearly in the illustration of the back axle, is now on top, in a perhaps somewhat less accessible position than previously, when it was attached behind the axle casing, and when its removal was not hampered by the proximity of the body, which is, perhaps to some extent, the case now. There are ball journal bearings B and B1 to the worm-shaft and this shaft has not the worm cut upon it, as is usual, but has castellations to engage threads on the worm. Very noticeable is the worm-thrust bearing B2.

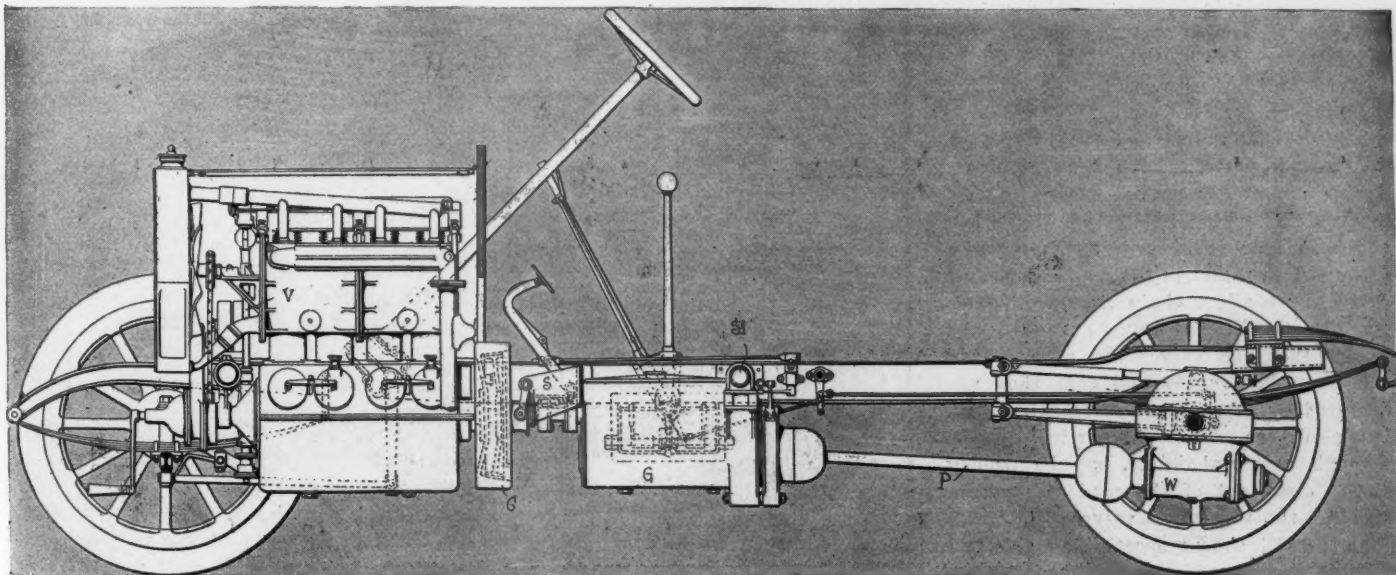
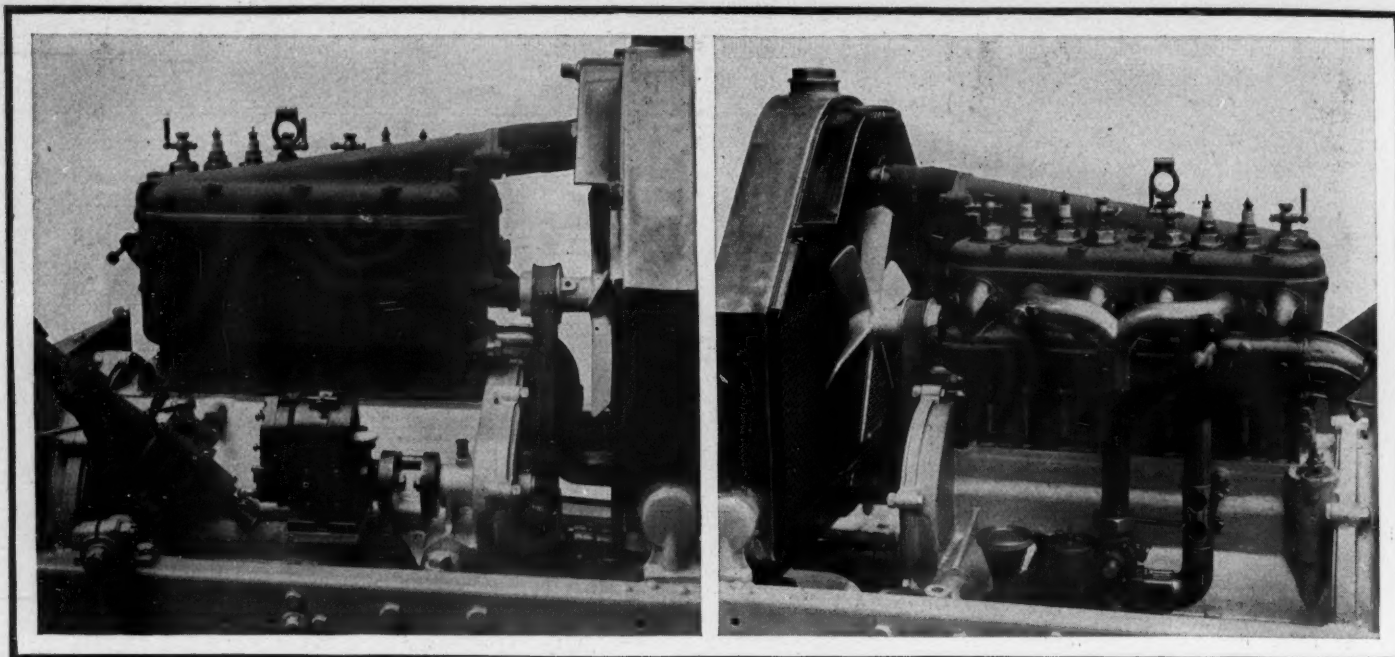


FIG. 6—ELEVATION OF MAUDSLAY WORM-DRIVE CHASSIS



TWO VIEWS OF 10-12-HORSEPOWER MOTOR USED ON BELSIZE

which has balls of no less than $\frac{3}{4}$ -inch diameter, and seems to allow for a thrust pressure so great that it can hardly occur in practice. However, the fault, if any, is a good one. The only other noteworthy feature is a stuffing box for the worm shaft, which is provided with a gland P, consisting of a bronze ring only pressed against the packing by a coiled spring S.

A few words with reference to the chassis are perhaps necessary to back up any information that may be gleaned from Figs. 6 and 1, showing respectively an elevation and a plan. In the first case, the chassis has a simple appearance, due to the direct treatment of such parts as brake tension, rods, foot pedal arrangements, etc. The neat appearance is perhaps assisted too by the fact that the gear box G is in one piece, though it has a large cover for accessibility. The support for the gearbox at the front end is a flat stay S of considerable depth, and at the rear end it is suspended at two points from a tubular cross stay S1. The clutch is of the pattern which is now so popular, viz., the external leather cone clutch.

The parallel radius and torque rods of last year's pattern have been retained, having apparently proved successful. As regards the engine itself, the writer has not been able to observe any alteration of importance, though the magneto is now driven by a silent chain from the crankshaft. It will be well to remind the reader that the valves are overhead in the Maudslay engine and that they are operated by an overhead camshaft, which, being driven from a vertical shaft, through universal joints, can be readily swung clean out of the road in preparation for the process of valve withdrawal. Figs. 2 and 3 show respectively a side and a front elevation of the 17-horsepower engine. In the latter the magneto silent chain and its aluminum casing C is clearly

shown, as well as the neat form of universal joint U, to permit the radial movement of the overhead camshaft S.

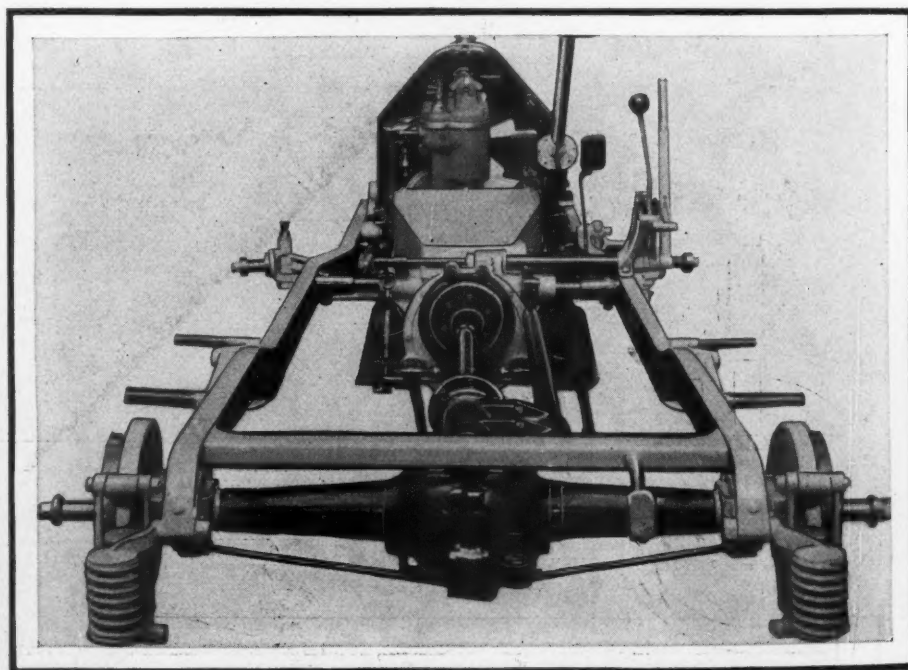
Belsize Cars

The new 10-12 horsepower Belsize model is this firm's chief exhibit. This car has been produced with an idea of competing with the American productions. It is fitted with four cylinders cast en bloc, with bore and stroke 60 by 130 millimeter. Two views of this engine are shown above from which it will be seen that the combustion chamber is detachable from the cylinder barrel. The valves are arranged in single file and are enclosed. The camshaft is driven by silent chain supported by a jockey pulley with a spring self-tensioning control. The

normal speed of the engine is 1000 revolutions per minute. Thermo-syphon cooling is adopted, and the radiator is of the crinkled tube pattern.

Reference in these articles already has been made to the Claudel-Hobson carburetor, which is the one fitted by these makers. Lubrication is effected by a combination of the forced and splash system: a cogged-driven pump immersed in oil distributes the fluid to an internal pipe which leads to the main crankshaft bearings, and by another pipe which supplies shallow transverse troughs below the connecting rods. A Bosch magneto is fitted with fixed timing.

The clutch is of the inverted metal-to-metal cone type. An illustration of the



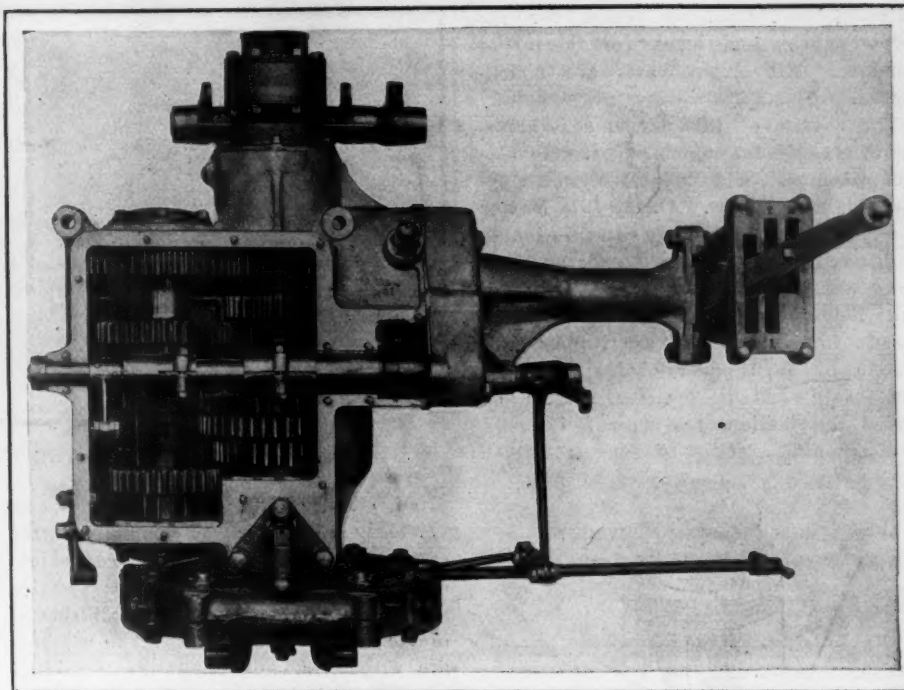
SHOWING CLUTCH AND UNIT CONSTRUCTION ON BELSIZE

chassis below show the unit construction of the engine and gearbox. Separate access, however, is obtained for the clutch and gearbox without dismantling any other parts. The gearbox is circular in form and registers with the trunk casting of the engine base, and is removable endwise. The gearbox gives three speeds with direct on the top gear, the gears being controlled by the usual gate change lever. The drive from the gearbox to the back axle is by means of an overhead worm. The rear springing is by semi-flat elliptic springs, 42 inches long by 1¾ inches wide. These are anchored at the front end and shackled at the back to a pair of coil check springs. The front springs are 30 inches long by 1¾ inches wide. All spring joints are provided with the usual grease cups. The wheelbase of this car is 96 inches and the tread 50 inches, and the approximate weight of the chassis 12 hundredweight, with the tires.

Five Deasy Models

Five examples of the J. D. Siddeley type Deasy cars are shown in the two of the models—the 12 horsepower and the 14-20 horsepower—there is practically no change from the types which did so well last season. The 12 horsepower, which is shown with a four-seated torpedo body, now has four speeds as standard equipment, instead of three as last year; but in the 14-20-horsepower car, which no mechanical change has been considered necessary, although the details of equipment have been, where possible, improved. The example shown has a new lightweight torpedo body, the designer of which appears to have refined and lightened wherever possible in the same degree as in the J. D. Siddeley type Deasy, the chassis itself has been refined.

In the other two models—the 18-24 horsepower and the 24-30 horsepower—a considerable change has been made



GEARBOX USED ON THE DEASY FOR 1912

by the substitution for the poppet-valve engine of Silent Knight sleeve-valve motors, fitted with the patented vibration damper, by which all vibration and noise at high speeds is absorbed. This step has been taken after a series of most careful and exhaustive tests, the opinion being that for cars of this size the adoption of the sleeve-valve motor is an undoubted improvement both in silence and efficiency. In the 18-24-horsepower model the engine is of four-cylinder, 90 by 130 millimeters, with the new Deasy two-jet carbureter. The gearbox is fitted with four forward speeds and one reverse. The transmission is by worm drive.

The 24-30-horsepower model has a six-

cylinder motor, 90-millimeter-bore by 130-millimeter stroke, also with new Deasy two-jet carbureter. It is practically a new model, introduced to meet the wants for a moderate-powered six-cylinder car.

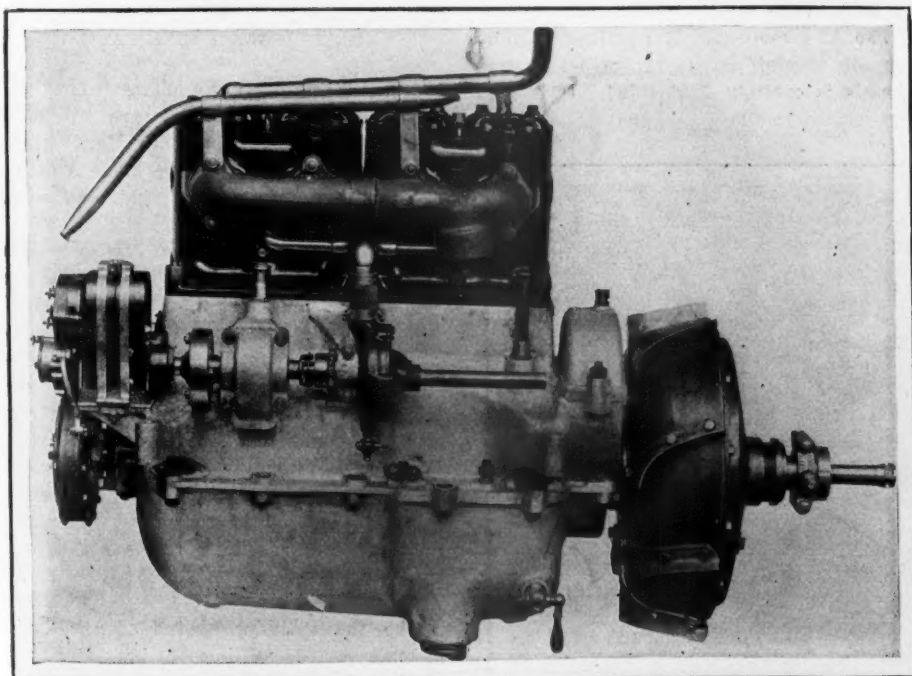
The Napier Exhibit

The following brief particulars embody the salient features of the Napier exhibit: The 65-horsepower six-cylinder noiseless Napier torpedo saloon, as its name implies, combines a long, low luxurious carriage, with plenty of head room. The body is constructed of aluminum as regards panels, roof and scuttle. It has one door on either side, and accommodates four persons in all, two on the main rear seat and the owner-driver and passenger on the front. Access to the front seat is through a division between them, so it will be seen that the car is really a saloon carriage.

Interior illumination is by concealed electric lights in the roof, which itself is natural aluminum, treated by a special process and constructed in the form of a semi-ellipse in cross section, gradually flattening out on the length of the car to the front over the dash board.

A scuttle, forming part of the body and not attached rigidly to the dash, carries a V-shaped wind-deflecting glass shield, attached at its upper part to the roof of the car. Both sides of the V have a movable window, each can be opened independently and has a special deflector to carry the wind above the heads, no matter at what angle the main windows are opened.

The finish, both of interior and exterior, is very beautiful. Some fine sherton panel work is in the interior; the upholstery, which is the last word in luxury, is in old gold shade of silk brocade, quilted and buttoned throughout. The



MOTOR OF THE 18-25-HORSEPOWER DEASY

painting is Neapolitan yellow for the lower panels, and black for the upper portions. All bright parts are nickel-plated.

The chassis of this car is a 65-horsepower six-cylinder colonial type, with 142-inch wheelbase, and Rudge-Whitworth detachable wire wheels. All the 1912 Napier specialties are on this chassis—double ignition by magneto and Napier synchronized with accumulator; cylinders cast in pairs, 5-inch bore and 5-inch stroke; three speeds, top direct, with the Napier gate system of silent gear chains; multiple metal-plate clutch; positive system of forced lubrication to engine, insuring economy and absence of smoke; Napier

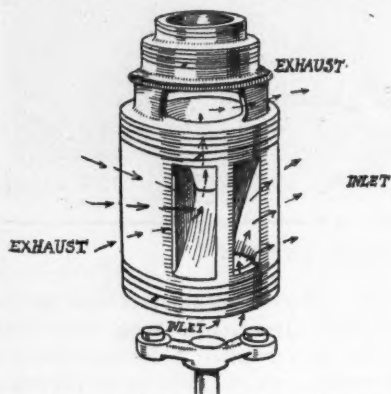
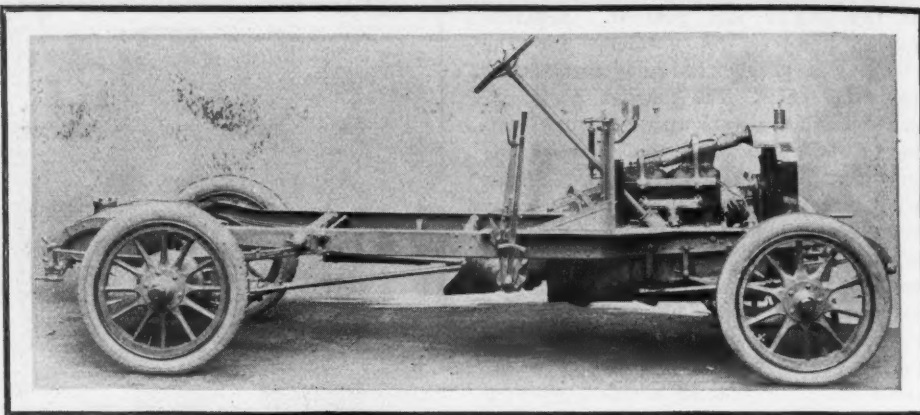


FIG. 7—ITALA ROTARY VALVE

controllable carbureter and hydraulic air-regulator.

The 15-horsepower four-cylinder Napier three-quarter landaulet on a model de luxe chassis accommodates six persons in all, two on the main interior seat, two by folding seats inside, and the usual two on the driver's seat. This body is constructed on sensible and pleasing lines, and as the model de luxe chassis permits the use of a body of ample proportions, this landaulet has comfortable seating capacity, and moreover wide entrance doors opening right back, a most essential point for convenience of users, but which is frequently overlooked. The usual interior appointments of a high-class car are



CHASSIS OF THE 15-HORSEPOWER NAPIER

fitted, electric light controlled by a conveniently placed switch, completely fitted companions and a Hall flap, a convenient device that allows direct communication with the driver through a small shutter in the window behind him. The windows are frameless, admitting the maximum amount of light, and absolutely without rattle, and there is no outside and unsightly joints to the leather folding head.

High side doors to the driver's seat, a glass wind screen over the inclosed dash, and steps covered with aluminum plating are some of the equipments.

Napier Chassis

The chassis is the latest 1912 type, 118-inch wheelbase, with downswept side members to allow a low and easy entrance. The chassis also will have the Napier triple spring rear suspension, the new built-up rear axle casing, multiple-plate clutch, three speeds, transmission by worm drive and the new Napier two-jet carbureter, controlled by foot accelerator. The magneto will have an advance and retard actuated by a lever on the steering wheel. There is thermo-syphon water-cooling and forced lubrication. Rudge-Whitworth detachable wire wheels are fitted.

The 15-horsepower four-cylinder Napier torpedo touring car on the model de luxe chassis is entirely flush-sided. It is very light and both brake and chain gear levers

are inside. A scuttle extension of the dash, with adjustable ventilator is fitted. The seating accommodates two on the back and two in front seat, and as the Napier system allows for adjustment of the steering column and the levers to any angle, these are set in a most comfortable and convenient position for the driver.

There are no outside handles, the doors being opened by vertical levers and the roll of the upholstery is continued right

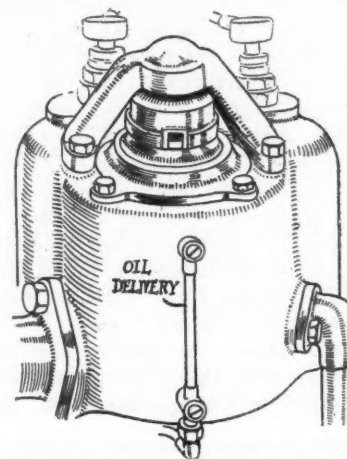


FIG. 8—ITALA VALVE CASING

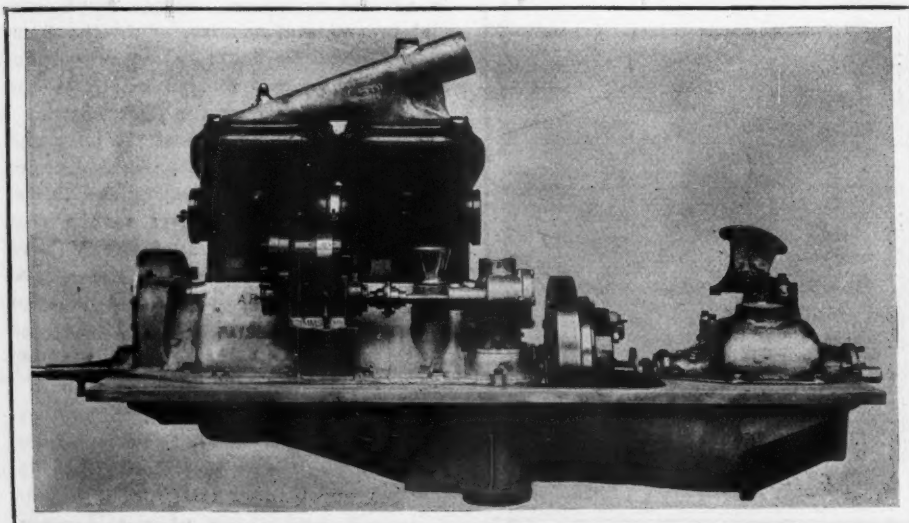
along the tops of the doors. The seat cushions and back rests are all most comfortably upholstered in dark green leather. A collapsible cape hood is fitted, which, when up, is very rigid, and when down is quite flat.

A hinged glass screen has its lower half forming a continuation of the scuttle and set at the angle of the steering wheel column, while the top portion is arranged with a joint so that it can hinge outwards.

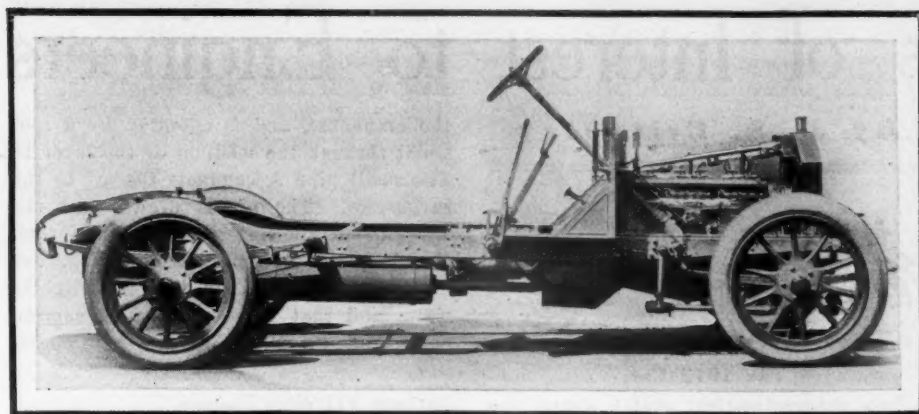
To gain increased lightness, all the wings are made of aluminum, and the space between the platform steps and the chassis frame is filled in to prevent mud splashing onto the body. A sloping footrest is fitted in the interior for the rear passengers, which forms a tool receptacle as well.

The Itala Car

The four-cylinder engine of the Itala company, 105 millimeter bore by 150 stroke, is interesting by reason of the adoption of rotary valves, illustrated by



POWER UNIT OF 11.9-HORSEPOWER ARROL JOHNSTON



CHASSIS OF 30-HORSEPOWER NAPIER SIX-CYLINDER

Figs. 7 to 10. One valve operates for two cylinders, which is fixed within a cylindrical valve chamber, the diameter of which is little over 4 inches, and in the walls of this valve chamber there are two vertical slots some $\frac{3}{4}$ inches wide and about 3 inches in length, which form ports through which the inlet charge passes and the exhaust gases escape from the respective cylinders. Therefore, there is only one port to each cylinder.

The rotary valve itself has ports to

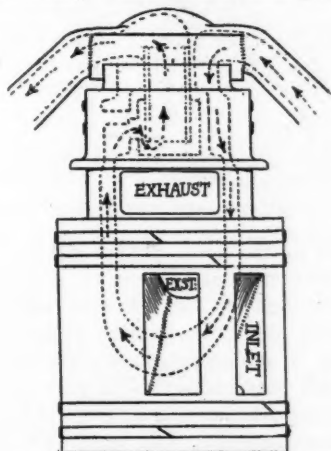


FIG. 9—OPERATION OF ITALA ROTARY VALVE

register with the ports leading to the cylinders, but in the case of the valve there are two ports, one for the exhaust and one for the inlet, the exhaust port being some 30 per cent greater than the inlet port. The valve is provided with three sets of rings, two at the bottom of the main valve casting, two at the top, and two at the head of the extension piece. In order to understand clearly the working of the valve reference must be made to the illustration of the distributor valve, Fig. 9. It will be noticed that the exhaust port is led to the top of the distributor valve, and then is carried forward through a manifold integral with the cylinder casting to the exhaust pipe proper. It is obvious with a valve of this nature that some means would have to be adopted for keeping the same quite cool, and for this purpose it will be noticed that the valve is cored so that water passes right through it and around it whilst it is rotating.

The cycle operation is as follows: The cylinders follow the general order as regards firing and assuming that the exhaust charge from cylinder No. 2 is passing; when the piston of this engine has reached the top of its travel the piston of No. 1 cylinder will be just finishing its firing stroke, and therefore is in its turn just ready to commence the exhausting, and of course by this time the exhaust port and the distributor valve have moved round sufficiently to close the port of the second cylinder, the diameter of the valve being so arranged as to reduce the necessary speed to one quarter of that of the engine.

As there is only one port to each of the cylinders, it is necessary that the valve shall be so designed that there is an intervening wall of metal between the exhaust port and the inlet port of the valve sufficiently wide to cover both ports in the cylinders, and in this way as soon as the exhaust port has been closed at the end of the exhaust stroke the same port is almost immediately re-opened for the inlet gas. In order to get over the difficulty of the thrust of the explosion on the valve a small hole is drilled right through, which passes through the water circulating sys-

tem and allows the gas to impinge on the far side of the casing, which is slightly recessed to permit the back pressure to balance the side thrust due to the explosion of the inner side.

Further precautions are taken to prevent any chance of seizure; each of the

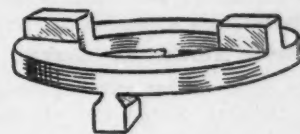
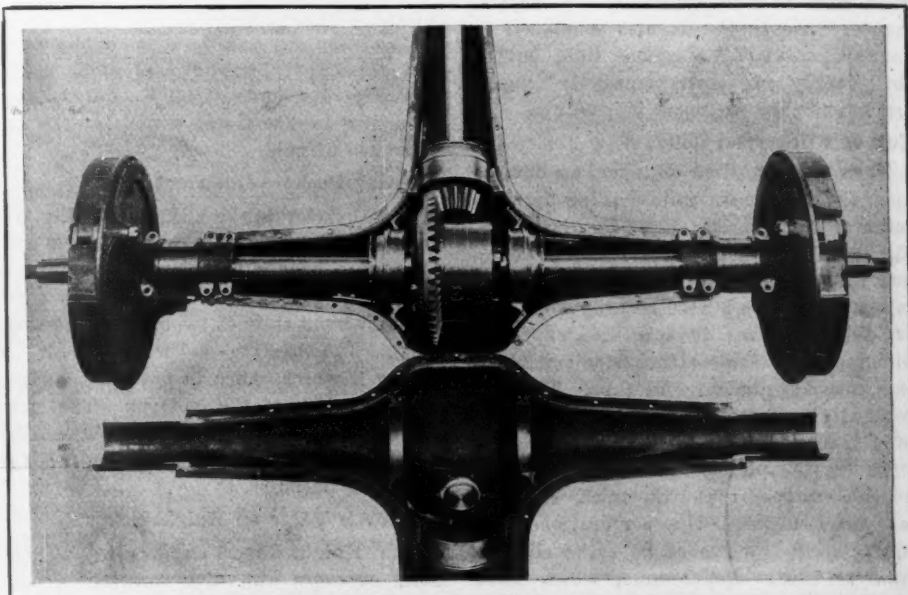


FIG. 10—ITALA SAFETY VALVE COUPLING

valves is driven by a vertical spindle through an interposed coupling. Referring to Fig. 10, it will be seen that the dogs or projections of the lower half of the coupling are undercut, so that should the valves seize, the undercut dogs will shear off.

DAIMLER SUES ARGYLL

London, Nov. 10—The Daimler company, holder of the patents for the Knight-sleeve-valve motor, opened war on the Argyll Motor Car Co., of Alexandria, Scotland, today for alleged infringement of patent. The Argyll is exhibiting at the London show a single sleeve-valve motor having a combined rotary and reciprocating motor which, it is alleged, is an infringement of the Knight patents. Action has been commenced by the issuing of a writ against one of the London agents of the company, this being done in order that the case may be fought out in the English instead of the Scotch courts. In conversation with a Motor Age representative, Charles Y. Knight declared that actions of this nature were so costly that they never were undertaken unless the company was confident of success. "In the present case the Argyll people are not in our field, but they have to pass through our field to get to their own."



REAR AXLE ON 15-HORSEPOWER FIAT

Olympia Ideas of Interest to Engineers

LONDON, Nov. 10—American engineers visiting the Olympia show find many new things of interest on the cars on view. A brief resume of the features of some of the devices are appended below:

Knight-Rover Air-Suction Silencer

In the early motor car engines, built by the Daimler Motor Co. of England and by the German firm of the same name, it was customary to fit a small chamber for silencing the air suction. This custom appears to have dropped out to a large extent. At the present time, however, cars have been rendered so silent in running by various devices, such

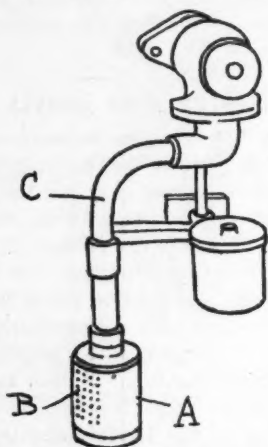


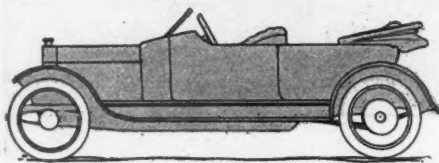
FIG. 1—ROVER AIR-SUCTION SILENCER

as sleeve engines, worm-driven rear axles and other improvements that the sucking noise caused by the inrush of air into the carburetor is more noticeable than in the past. On the 12-horsepower Knight-Rover engine a small cylindrical air silencing chamber is now fitted. A sketch of this appears in Fig. 1. A is the silencing chamber, which has perforations at B, through which the air passes up into the inlet pipe of the engine C. A supplementary air supply is also employed in connection with the carburation, but as this supply is drawn from the engine crank chamber no noise is possible.

Turner's Universal Clip

There are a number of ingenious devices upon the market for joint-making between radiator and engine; the one illustrated, Fig. 2, Turner's universal clip, however, has the advantage over most other types in that there is no need to keep a number of different sizes to suit different tube diameters, the same attachment suiting in this case any diameter of tube. The perforated clip portion A is made in lengths of 4 inches, or thereabouts; a piece sufficient for the pipe diameter in use is cut off and wrapped round the tube. A screw is passed through the perforations and square nuts B serve to hold the clip securely. These square nuts, which have rounded edges on one side, have the holes in them drilled eccentrically so that by

By J. S. Critchley



The 1912 Car

This diagrammatical sketch shows the typical proportions of the 1912 motor car, as well as the general body lines. It will be seen that the front wheels are placed centrally beneath the radiator; that the body falls away in size when it meets the bonnet; that there is not excessive clearance between wing and tire; that the whole body is pitched fairly low, and that the general tendency is towards a car that shall have smooth and almost boat-like lines as to its coach work and that there shall be no abrupt curves or projections of any kind to interfere with the simplicity of appearance.

giving them a quarter of a turn a little more or less pressure may be put upon the

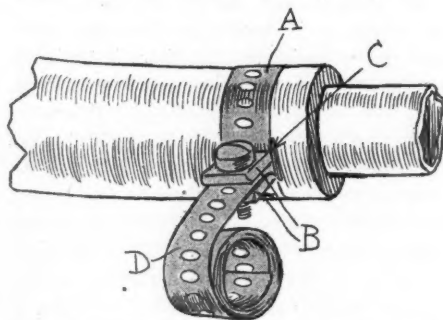


FIG. 2—TURNER UNIVERSAL HOSE CLIP

clip. There is a small inserted piece C to bridge over the gap between the turned up ends of the clip. The roll D is of course cut off after the joint has been made. The clips are made of mild steel and also of a new bronze metal which has the appearance of gold.

Crossley Brake Adjustment

The Crossley brake adjustment, Fig. 10, is a rapidly adjustable device which consists of a bronze milled nut A having a long hexagonal boss. The boss has right and left hand threads to suit the brake rod ends. The locking is performed by a spring B which, when in position, engages any two sides of the hexagon. The locking device has a nose by which it can be readily slipped out of engagement for adjusting purposes.

Extra Air Valve on Knight-Rover

The Knight-Rover engine has a neat form of extra air valve working in connection with the S. U. carburetor, fitted, Fig. 3. The valve is mounted on top of

the crankcase, and is operated by a foot pedal through the medium of the lever B. The small pipe A conducts the air to the carburetor. The air is drawn past the valve from the interior of the crank chamber, the reason of this being, one imagines, that the air may be slightly warm and that there may be no suction noise produced when the valve is in operation.

Darracq Valveless Engine

The Darracq Co. is introducing for 1912 a new so-called valveless engine, this term conveying a somewhat wrong impression, as the engine has a rotary valve in the

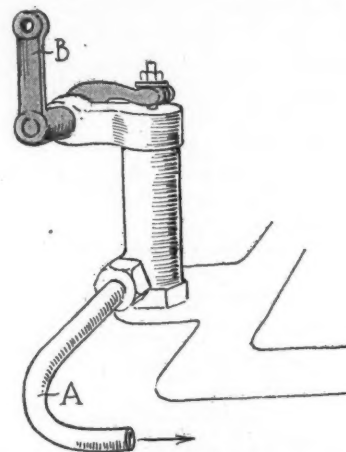


FIG. 3—EXTRA AIR VALVE ON ROVER

absence of the usual poppet valves. The valve is somewhat interesting, and it will be seen that its between-port section is D-shaped, the same opening in the valve serving to make communication between the inlet port and cylinder port and between the exhaust port and cylinder ports in the manner that will be clear from an inspection of Fig. 4, which shows a diagrammatical section of the engine cylinder.

An important feature of the Darracq system is that at the period of maximum pressure and temperature, that is at the top of the stroke, this port making com-

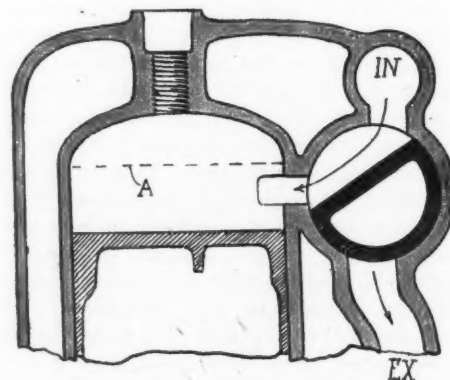


FIG. 4—DARRACQ ROTARY VALVE

munication between the valve chamber and combustion chamber is masked by the piston, the top position of the piston

being indicated by the dotted lines A in the illustration. Thus the valve is exposed at no time to the maximum pressure of explosion, so that the problem of making and maintaining it pressure-tight is not such a serious one as it otherwise would be.

Body and Dashboard Attachment

Leather is fitted between the dashboard and the body so that there is no direct con-

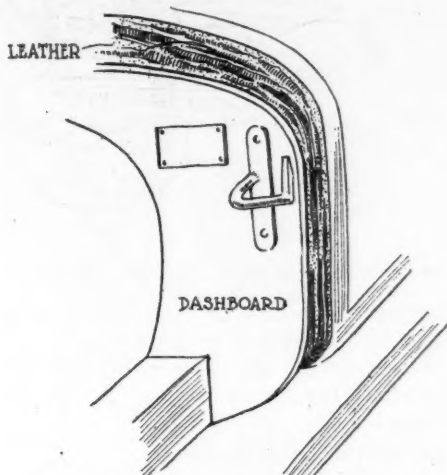


FIG. 5—LEATHER PACKING IN SHEFFIELD-SIMPLEX

tact between these two, in Fig. 5, showing the Sheffield-Simplex body and dashboard attachment. The idea is to insulate any sound or vibration set up in the dashboard from the body, and thus to secure greater comfort for the occupants of the car.

Fafnir Brake Compensating Arrangement

In the Fafnir brake-compensating arrangement, Fig. 6, the compensating link

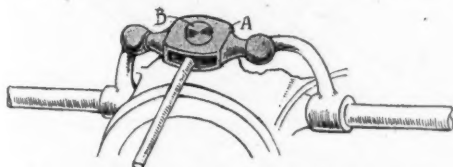


FIG. 6—FAFNIR BRAKE ADJUSTMENT

A takes the form of a slotted lever, having a large central pin B. There are ball joints between a compensating link and the brake levers. The length of the slot permits of a considerable diverse angle between the two brake levers.

Simms Automatic Magneto Advance

The Simms automatic magneto advance is an ingenious little coupling which automatically alters the advance of the magneto armature according to the speed of the engine. It will be obvious that the relative positions of the contact-breaker and armature are constant so that the spark invariably takes place at the best armature position, that is, that at which the maximum number of lines of force are being cut.

The device consists of two coupling pieces and a pair of steel balls. One coupling piece A, Fig. 7, is convex in shape and has cut in its surface a couple of

volute slots C C of hemispherical section to suit the driving balls D. The other coupling piece B has a concave face with a diametrical slot cut across it. The

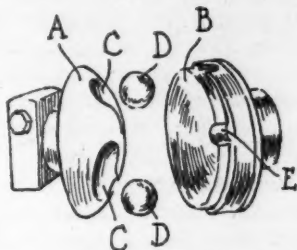


FIG. 7—SIMMS MAGNETO COUPLING

convex or driving member rotates in such a direction that the tendency of the balls is to roll inwards, that is, towards the central axis of the coupling. In this position the magneto is fully retarded.

When the speed of the magneto increases centrifugal force acting upon the balls causes them to fly out somewhat, since, however, they lie in grooves of volute form in one section of the coupling, and in a diametrical groove in the other, the effect of outward movement is to alter the relative positions of the two sections of the coupling, or in other words, to advance the armature of the magneto machine. In the center of the disk B is a fiber stud E, which acts as a stop for the balls when they return to the central or retard position, owing to a falling off of the driving speed. The convex disk is furnished with a boss, having a screwed stud which acts as a cotter pin and also as a means for obtaining fine adjustment in the first setting of the coupling.

On the driving shaft is cut a small worm gear in which the screwed stud engages by which the convex disk can be set in any position with regard to the driving shaft. It should be noted that the coupling cannot be applied to a generator of the dynamo type, which requires a constant driving torque; the working is only rendered possible by the fact that the load imposed by the magneto armature is intermittent and not constant.

Frier & Martin Water Joint

Frier & Martin, the makers of the Frier & Martin three-jet carbureter, have introduced a very neat joint for use for

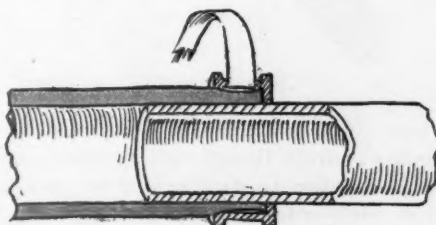


FIG. 8—NEAT WATER JOINT

coupling up radiator and engine water leads. It consists of a shallow channel section ring, having milled edges; there is a slot cut tangentially about $\frac{1}{8}$ inch wide. A couple of these rings, a short

length of rubber hose and a few feet of tape are all that are necessary to make an extremely neat and at the same time water-tight joint. When the ring is in position the end of a piece of tape is inserted in the slot, the ring then is twisted round and as the tape is prevented from slipping on the rubber it is, so to speak, wrapped round the rubber pipe by the ring in sufficient quantity to form a joint, the loose end subsequently being cut off. To disconnect the joint rotation of the ring in the opposite direction, owing to the tangential direction of the slot, unwinds the tape, and sets the ring free. It is not easy to imagine a more simple joint or one of neater appearance.

Chenard-Walcker Innovation

In the 10-12-horsepower Chenard-Walcker engine there is a novel feature, the purpose of which is to reduce to a minimum valve tappet noise. Fig. 9 shows a sketch of the arrangement. It

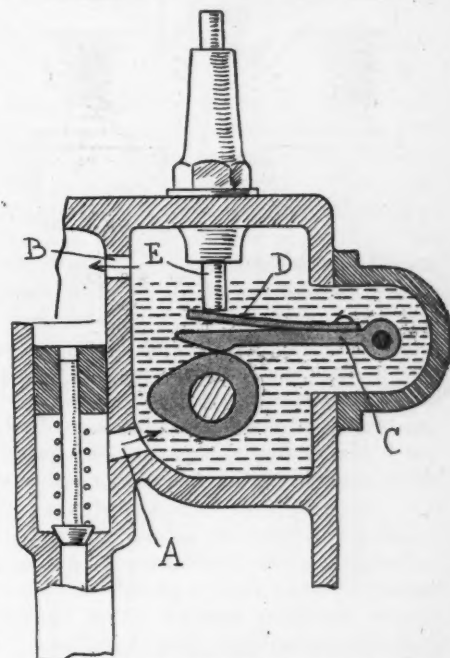


FIG. 9—CHENARD-WALCKER VALVE TAPPET

will be seen that the camshaft revolves in an oil bath. This bath is kept supplied with oil by the fact that it is in communication with the overflow side of the oil pressure system through the safety valve and by way of a small hole A; whereas an overflow hole is situated at B, which passes superfluous oil back into the crank chamber. The fact that the cams and the tappet ends are actually immersed in lubricant while in motion should of itself tend towards suppression of noise, but there is another somewhat ingenious and important innovation. On the top of the tappet radius arm C is fixed a flat spring blade D, which normally takes about the position shown in the sketch, that is, it holds the tappet E against the lower end of the valve stem and at the same time maintains the radius arm in contact with the cam. Thus, such clearance as there is exists between the

spring blade and the upper flat side of the radius arm. Before these two pieces can make contact the oil between them

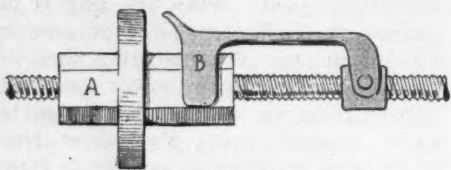


FIG. 10—CROSSLEY BRAKE ADJUSTMENT

has to be squeezed out, and thus the blow of contact is softened and noise practically eliminated.

Standard Propellor Shaft

Among the many devices for absorbing the torque due to the drive of the back axle the arrangement, Fig. 11, fitted to the

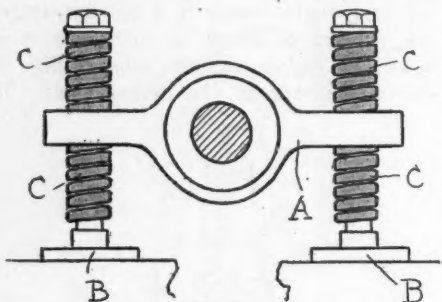


FIG. 11—STANDARD PROPELLOR SHAFT

Standard 14 horsepower car is a good one. At the forward end of the propeller shaft tube is a cross piece A, secured horizontally to the tube. This piece has a hole at each end, through each of which holes passes a bolt. The bolts have spherical heads and are held in brackets, B B, which are secured to a part of the frame. Stout square section helical springs are mounted upon these bolts as indicated in the sketch. Normally the cross piece A is in balance between the sets of springs; but any severe tendency of the cross piece to rise or fall is resisted either by the upper or by the lower pair of springs.

Lever-Spring Suspension

The lever-spring suspension, Fig. 12, consists of a very well-worked out device for absorbing all the minor road shocks which the car springs, owing to their great length are unsuited to deal with. The spring shackles A are attached to the lever B which is in its turn keyed to a spindle having a ball bearing of which the housing can be seen at C. On the opposite side of

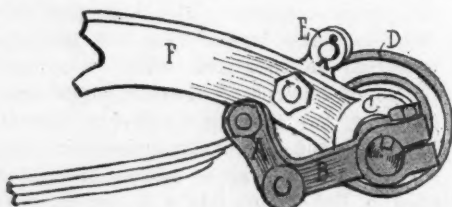


FIG. 12—LEVER-SPRING SUSPENSION

the housing is attached to the spindle, a spiral spring D which has its other end anchored at E. The link E is fixed to the dumb iron F of the car. As the device is

ball-bearing mounted it will be realized that the slightest movement of the laminated springs will take effect upon the lever B and oscillate it slightly against the pressure of the spiral spring D. It is in this manner that all minor shocks are absorbed. The device takes many forms to suit various spring constructions, but the essentials of the short lever, the ball bearing and the spiral spring are common to all.

Zedel Compression Tap

The sketch of the Zedel compression tap, Fig. 13, is self-explanatory. A screw down plug serves to close the opening to

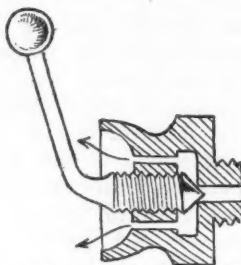


FIG. 13—ZEDDEL COMPRESSION TAP

atmosphere, which is by way of a series of small holes leading from a cup into which gasoline may be poured. The fitting has an insulated ball handle and displays a neat appearance.

Dunhill Spring Buffer

Dunhill, of accessory fame, is introducing a somewhat simple spring buffer for attachment to the front of the car to prevent damages to lamps, radiators, etc. The buffer itself, Fig. 14, marked A, is made of a flattened U-shaped brass tube, the tube is supported in clips B pivoted to the arms C; these arms, are held in

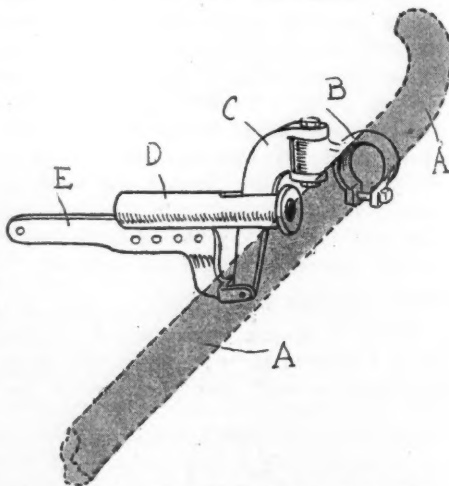


FIG. 14—ENGLISH SPRING BUFFER

brackets E and passed through slots in tubular pieces D, and which contain powerful springs to absorb a great part of the shock of impact. The brackets E are designed so as to be applicable to most standard cars, and are, of course, attached to the front spring arms.

The Churchill shock absorber, Fig. 15, is typical of the many rather similar arrangements to be seen at Olympia. The following is a brief description of its details: A

is the spring hangers and B the ends of the semi-elliptical spring to which is fastened to one end a pair of links, C C. About mid-way of the links C C, is a pivoted eye-bolt which catches hold of a volute spring D, which is in turn sup-

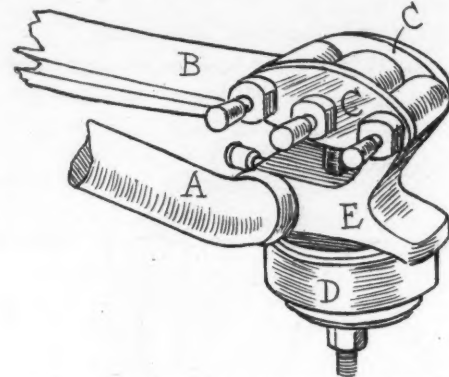


FIG. 15—CHURCHILL SHOCK ABSORBER

ported by the link E. Any shocks which may be transmitted to the spring B have to pass through the volute spring D before reaching the spring hangers A and the chassis.

Panhard Cam-Operated Gears

The sliding gears in the Panhard gearbox are slid along the shafts by means of a cam of a construction that is more com-

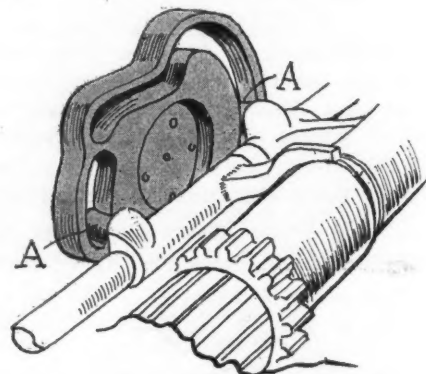


FIG. 16—PANHARD CAM-OPERATED GEAR-SET

mon in connection with machines used in the printing trade than in connection with the motor car. The cam is actuated by a toothed quadrant, not shown in the sketch. Fig. 16. The pins which engage in the cam grooves are shown at A A.

Wolseley Spring Shackles

The rear spring shackles on the Wolseley 16-20- and 20-28-horsepower cars are

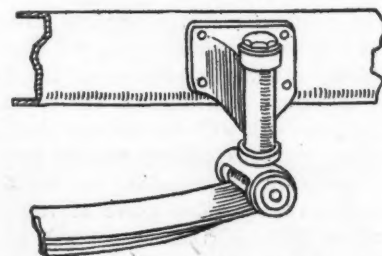


FIG. 17—WOLSELEY SPRING SHACKLES

perhaps somewhat novel in construction, and a sketch appears in Fig. 17. A stout bracket is bolted to the frame side members and the spring shackle is pivotally

attached to this bracket. Stauffer greasers are supplied for both the spring eye bolt and the vertical spindle of the shackle.

La Buire Radiator Suspension

The sketch, Fig. 18, shows the somewhat curiously shaped spring bracket by which the radiator of the La Buire car is

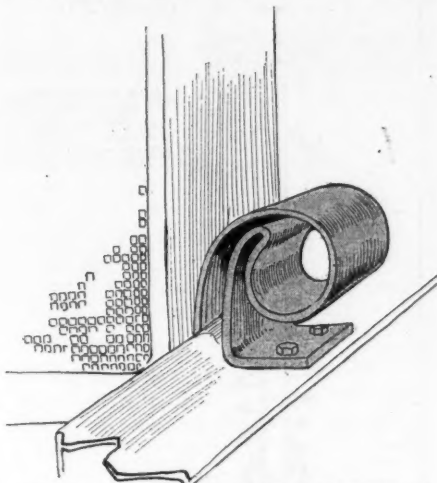


FIG. 18—LA BUIRE RADIATOR SPRING BRACKET

attached to its frame. The bracket is riveted to the under side of the radiator and attached by bolts to the frame. One would expect such a bracket to insulate vibration in a satisfactory manner.

New Cable Terminal

In Fig. 19, the ends of the wire are pushed into the channel piece A and are wrapped round the projecting boss B.

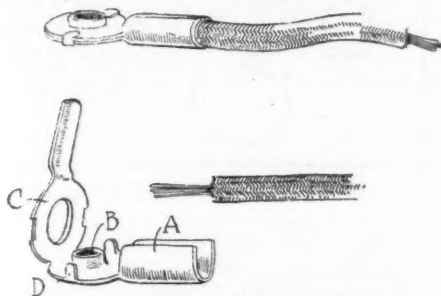


FIG. 19—NOVEL CABLE TERMINAL

The upright piece C is pressed down the small projecting tongues D, securing it in position and finally the ends of the channel piece A are turned over, thus making a secure and neat fastening.

Humber Frame

Fig. 20, showing the 24-horsepower Humber frame, is almost self-explanatory. The right-hand side member of the frame is set out as shown to make place for the change speed quadrant, the correct out-of-

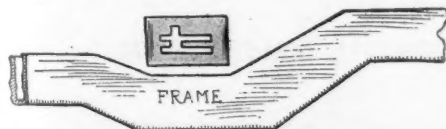


FIG. 20—OFFSET FRAME ON HUMBER

center position of the latter being, of course, important. The side member on the left is at this position straight, so that the two side members are not a right- and

left-hand pair. The 12-horsepower cars have a perfectly straight frame from front to back with a tubular cross member at the rear and a very deep pressed steel central cross member to carry the under frame. The frame of these small cars taken as a whole is perhaps one of the best on view at Olympia.

Crossley Magneto-Shaft Adjustment

The camshaft and magneto shaft of the Crossley cars, Fig. 21, are driven by silent chains and in order to obtain a fine adjustment for this latter an ingenious arrangement is provided. On a portion of the inner rim of the chain wheel there are two opposing notched sections; these notches are engaged by the similarly notched ends of an arm A mounted on a taper on the end of the magneto shaft. Two set screws, B and B, hold the wheel up in contact with the arm after the cor-

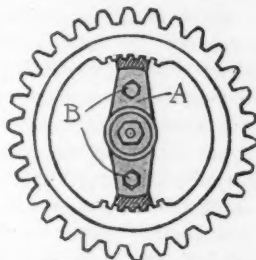


FIG. 21—CROSSLEY MAGNETO ADJUSTMENT

rect angular position has been fixed by a suitable engagement of the serrated parts. As the chain wheel is of good diameter and the notches or serrations are small ones the angular variation which can be obtained is sufficiently accurate for practical purposes.

Aberdonia Oil-filling Arrangement

A somewhat novel device is attached to the crank chamber of the 16-20-horse-

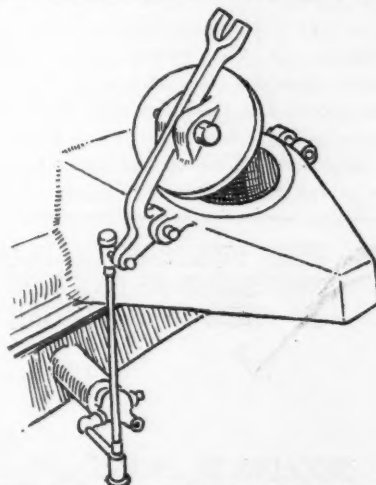


FIG. 22—OIL FILLER ON ABERDONIA

power Aberdonia engine. There is a large opening in one of the crankcase feeds for supplying oil to the interior and the cover which seals this opening is attached to a bell crank, the smaller arm of which serves to operate an oil-level test cock. Opening the cover also opens the cock, whereas closing it shuts the cock. There is thus no difficulty in opening this cock, which is in some engines in a somewhat

inaccessible position and moreover it is not possible to inadvertently leave the cock open except in the unlikely event of the large cover not having been shut down. This is illustrated in detail in the sketch, Fig. 22.

Austin Flywheel

The sketch, Fig. 23, shows the Austin flywheel and it will be seen that provi-

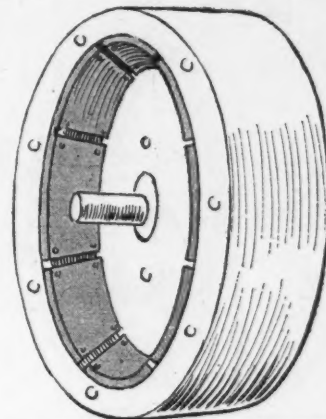


FIG. 23—LEATHER-FACED FLYWHEEL ON AUSTIN

sion is made for the usual type of cone clutch with one important difference, however. The leather instead of being fixed to the male part of the clutch is fixed to the female part. Each separate segment of leather is secured to a steel plate, and each steel plate is secured to the flywheel by a stud. The male part of the clutch is pressed from steel and is of very light though strong construction.

Vulcan Steering Gears

In the Vulcan steering mechanism, Fig. 24, instead of there being only part of a worm wheel, as is usually the case, a complete worm wheel is used and arrangements are such that each quadrant of the worm wheel may be brought into use in turn, with the obvious result of increasing the life of the gear as a whole. The taper shaft end A, which takes the vertical steering arm B has four feathers placed at 90 degrees to one another, the boss of the steering arm being slotted to suit. Thus

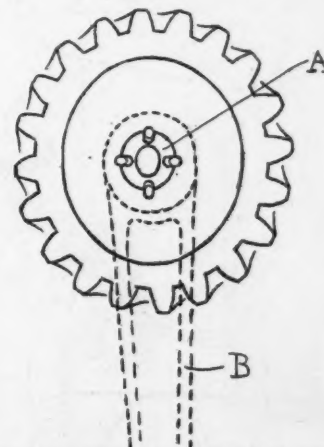


FIG. 24—VULCAN STEERING GEAR

it is clear that the arm can take any one of four positions on the spindle, each position bringing into use a different section of the worm wheel.

Germany Has Motor Show

BERLIN, Nov. 6—After a pause of 4 years a motor car show has been held in this city, to which the car makers of all lands have sent their latest models. Three hundred exhibitors displayed their latest products, and among these have been several American firms, among which were noted Ford, E-M-F, Flanders and Mitchell. The German maker does not greatly fear the American, because he thinks the horsepower too high. What is needed is a small motor with high speed, because car taxes here are based on bore and stroke of the cylinders.

The designers have made the running of the cars noiseless. This has been accomplished by closing up all movable members. In order to remove even the little noise that may be heard through the casing, silent chains for driving the camshaft and magneto have been adopted by well known makers. To remove the noise of the tappet stem one maker arranges a short piece of pipe around the valve stem ends, so that the oil enclosed serves as a cushion and another maker has adopted a conic-cylindrical valve head, Fig. 7. No space is left at A where the tappet rod adjustment is made. The use of a curved part B and lever L give a quiet valve action. The cylindrical part C of the valve acts as piston valve.

It has made some sensation among the motorists that only two types of valveless motors have been exhibited. Instead of this many manufacturers, amongst them the Mercedes Co., have redesigned the motor with inlet valve on top, claiming that greater power can be gained. This type is made entirely enclosed by extending up the waterjacket. Another maker provides cast-iron caps on top of the motor for the inlet valves, with the same result.

Inlet, exhaust, oiling and water pipes will be as far as possible a part of the motor

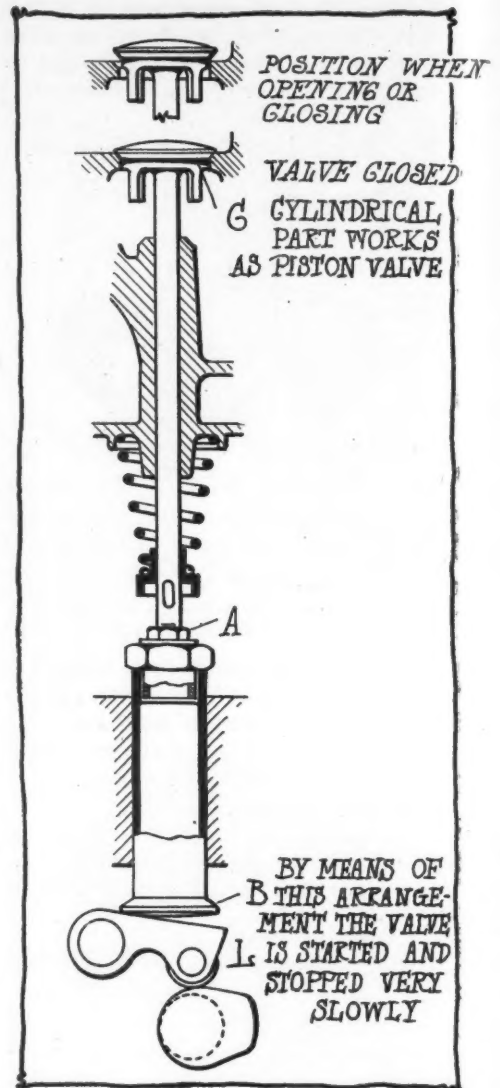
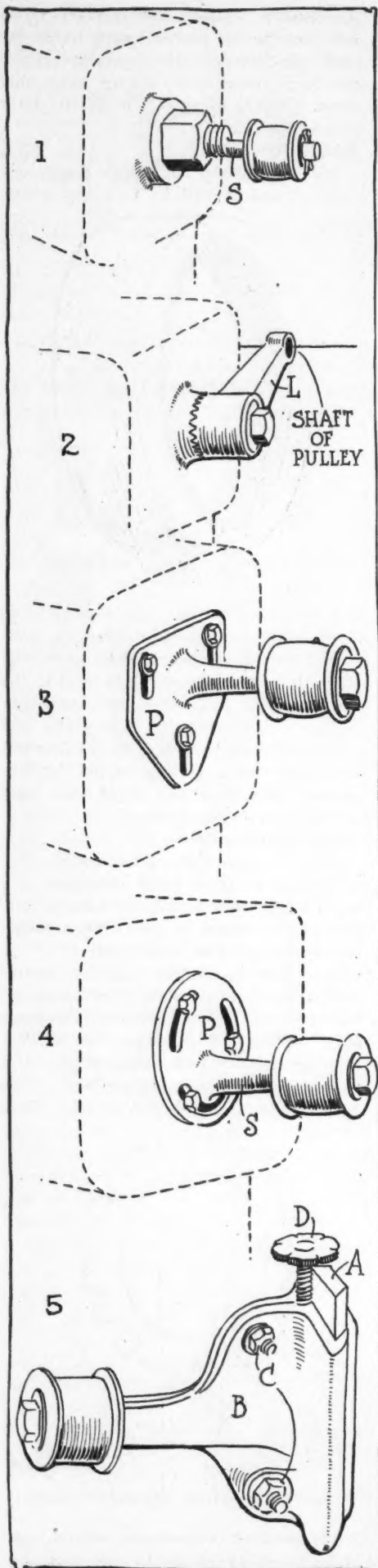


FIG 7—ADLER NOISELESS VALVE

casting. The long-stroke motor will be used, running at very high speed.

The four-cylinder block motor will be the rule; an exception will be the six-cylinder,



FIGS. 1, 2, 3, 4 AND 5 SHOWING METHODS FOR TIGHTENING FAN BELTS

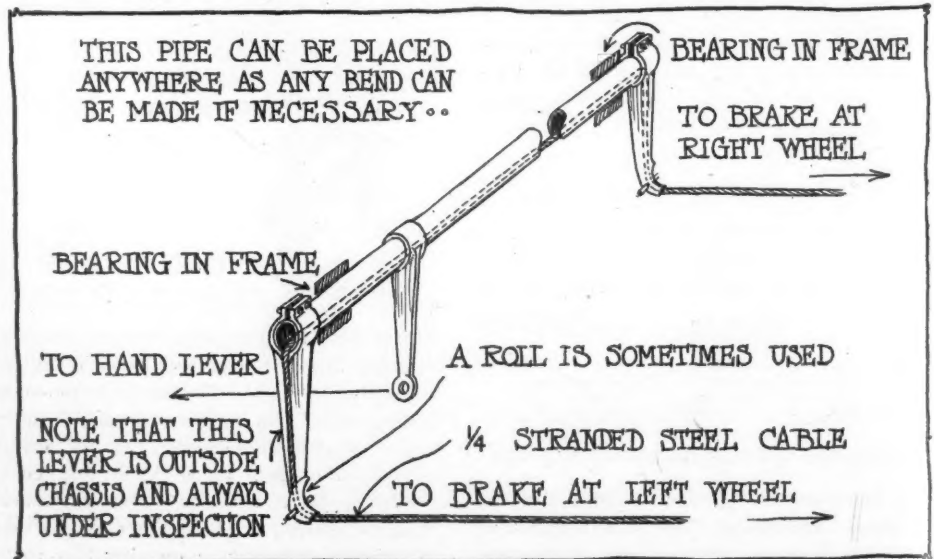
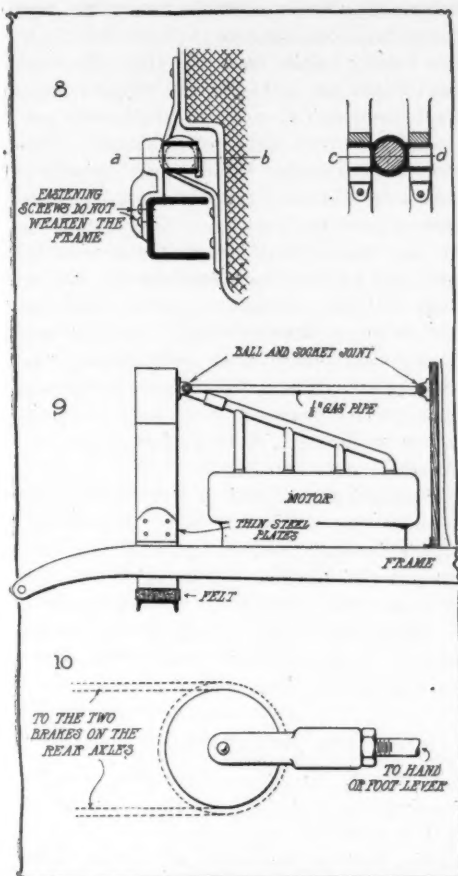


FIG. 6—BRAKE ARRANGEMENT ON MERCEDES CARS

Noiseless Engines a Feature



FIGS. 8, 9 AND 10—RADIATOR SUPPORTS AND BRAKE ADJUSTMENTS

which, by the way, is now on the German market even for so-called baby cars, or doctor cars.

Much versatility has been shown in the mechanical details of many cars. For pleasure cars and trucks a flexible suspension of the radiator has been adopted.

Five methods of fan belt adjustment are illustrated. Fig. 1 is by the eccentric shaft S which carries the fan pulley and is integral with a stud that threads

into the cylinder casting. Fig. 2 is an adjustable lever L, the outer end of which carries the pulley shaft, and the inner end is serrated to correspond with a serrated boss on the casting. In Fig. 4 the plate P has three C-shaped slots that are eccentric to the pulley shaft S. The plate is given a rotary movement to tighten or loosen the belt. Fig. 5 is a more elaborate and costly scheme, the bracket B carrying the fan pulley slides on a machined block A on the cylinder. Clamping bolts C, and a spanner screw D permit of loosening the bracket B so as to raise or lower it and also to anchor it at any desired point.

Some novel methods of equalizing the brake action are to be seen. In Fig. 7 is illustrated the cable brake connection employed on the Mercedes cars. To a tubular cross shaft designed to rotate in bearings in the side frame members is attached the rocker arm connected to the hand lever. A cable passes through the tubular shaft and over sheaves dropped from the ends of the shaft. Pins through the sheaves hold the cable in place.

Another car in which cable brake connection is employed provides equalization by allowing the cable to run from the brake on one wheel over a block on the end of the connecting link of the control lever and thence to the brake on the other wheel. This is illustrated in Fig. 10.

In another design, illustrated in Fig. 11, connection from the brake lever is attached to a flexible link on a hanger which is dropped from one end of the cross rod carried by the frame members. At the point where the link is pivoted to the hanger is taken off the connection to the brake on that side, while a similar connection is made at the corresponding point on the other side. The lower end of the flexible link is slotted and the end of a separate lever fastened on the cross rod engages in the slot.

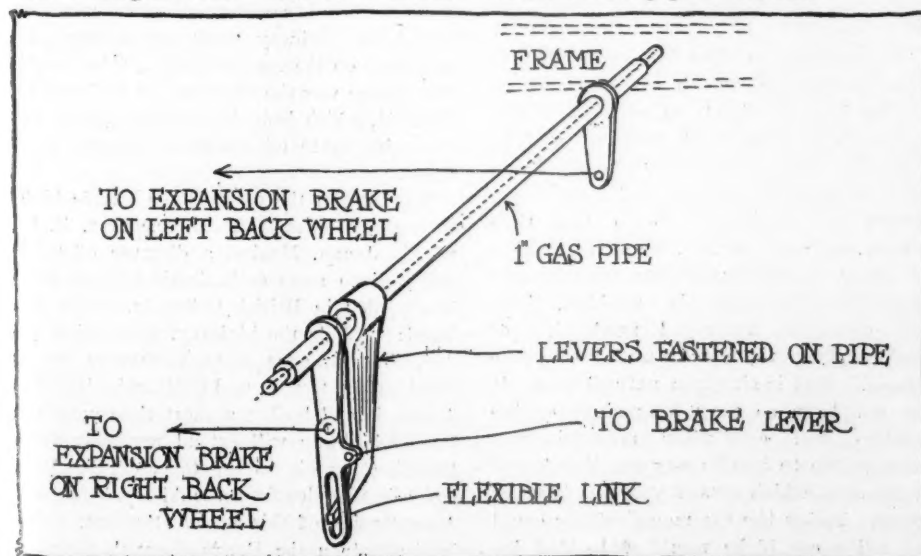
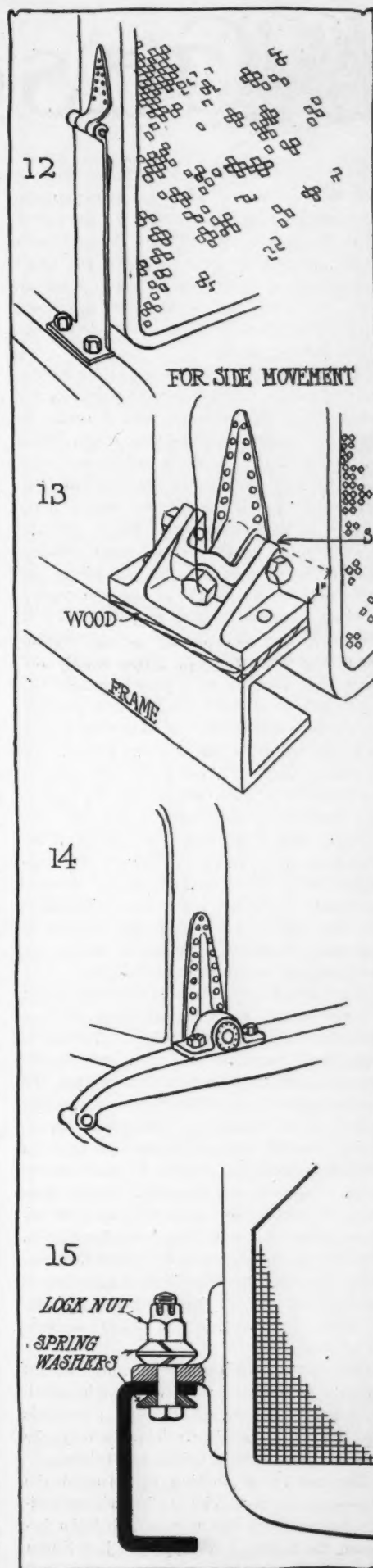


FIG. 11—GERMAN BRAKE-EQUALIZING DEVICE



FIGS. 12, 13, 14 AND 15—RADIATOR SUPPORTS ON GERMAN CARS



Gasoline



By Petroleum

Article IV

BEFORE proceeding further, it will be well to review what has gone before, and connect the loose ends. We have seen that the gasoline made from Pennsylvania crude, testing 66 gravity, gave the same results as a 58-gravity Kansas gasoline. The reason for this is that both gasolines, although differing in gravity, have the same boiling points.

The refiners make their naphthas having boiling points suitable for the purposes for which they are intended, and it seems to be a provision of nature that if the crude oil is light, it requires a correspondingly light gravity gasoline to produce low boiling points; and if the crude is heavy, it requires a correspondingly lower gravity gasoline to produce the same boiling points, the difference being just about the difference in the weight of the two crudes.

Some western boomer has said that if Columbus had first landed on the Pacific coast, the New England states would not have been touched by a plow, because the lands are so difficult to till and produce such poor returns for the labor expended, as compared with the western plains. Be this as it may, it is certainly true that if the western crudes, which are all heavy, had been first discovered, and we had learned the true value of gravity, we would not now accept a high-gravity gasoline except at a reduced price, because we would know the value was determined by heat units; but today the reverse is the case, because we began at the wrong end, and our education is at fault.

We have told you that the refiners test for the initial and maximum, as well as all intervening boiling points. Because a liquid will begin to boil at a certain degree of heat, it does not signify that the entire quantity will boil at this temperature; on the contrary, certain portions require a much higher degree of heat to produce ebullition. This is particularly true of petroleum products. Some portions of crude begin to boil at, say, 80 degrees Fahrenheit, and the final distillation requires a temperature of about 700 degrees Fahrenheit. The motor gasoline is usually cut out at temperatures ranging between 100 degrees and 350 degrees Fahrenheit.

We have seen that while low initial boiling points are requisite, high maximum points are equally essential; but this rise should be gradual. This is why the intermediate boiling points are taken.

The low initial boiling points start the explosion quickly. The gradual rising boiling points form the connecting links between the higher boiling points just like a fuse, giving ever increasing power and force to the explosion. If, however, we

had low initial boiling points and would suddenly jump to high boiling points, we would have a puff from the low boiling points; the higher would not explode, but would simply be expelled in the exhaust, performing no function except to foul the engine. The action would be similar to a charge in a gun, consisting of a percussion cap of quick-burning powder, the remainder of the charge being composed of very slow-burning powder. There is a very close similarity between quick-burning powder and low-boiling-point gasoline, and between slow-burning powder and high-boiling-point gasoline. With connecting links between, they both give an excess of power. Without the connecting link, they are both worse than useless.

Right here we have another illustration of how futile gravity is as a test. Suppose we have a number of products of petroleum, and we propose mixing them to obtain a given gravity. We take a gallon of high-gravity naphtha, say, 88—there are undoubtedly low boiling points in this, so we assume the engine will start quickly. We add a gallon of burning oil of, say, 48 gravity, and in this we would have high boiling points. The mixture being half and half, we would have a gravity of 68. If we believe in gravity alone, this would work, but it will not, for the reason, as explained above, there is no connecting link. It is true after an engine is heated you can run on kerosene for a while, but the engine would begin to kick if fed on it for a steady diet. This is certainly the death knell of gravity, so we might just as well bury it now as any time. What has been said above applies to conditions as they are today.

We believe the time is not far distant when carbureters which will successfully handle higher initial, as well as higher maximum boiling point gasoline, will be generally used. They are already being tried in the testing rooms, and satisfactory results are reported. When this time comes, and come it will, we will probably be using 50-gravity Kansas naphtha and 58-gravity Pennsylvania naphtha. This will mean an increased production of naphtha from the same amount of crude refined. This is simply a natural step. It has not been so very long since engine builders and carbureter manufacturers were unable to handle any gasoline below 74 gravity, which meant very low boiling points. Today the car manufacturer could not sell a car if he would state that his car could not run on anything less than

74 gravity. It would simply be an open confession that he was a back number.

It has been a source of surprise to every motor car user, that the price of gasoline has steadily dropped, in the face of an ever increasing consumption. This has been due simply to the fact that the carbureter manufacturers and the oil refiners have kept pace with each other; the former producing devices that will handle lower gravity and higher boiling point gasoline; the latter furnishing an increased production of gasoline adapted to the present requirements. And this can continue if all will join hands—the manufacturer, the refiner and the consumer—and all work together to conserve the supply of this fuel. The manufacturer who recommends, the refiner who sells, or the owner who uses high gravity gasoline is not only doing an injury to himself, but to the general interest.

We shall all be glad to welcome the advent of the carbureter that will handle higher boiling points, for with the consumption of gasoline increasing at the rate of 30 per cent each year, an alarming state of affairs is surely ahead of us, unless there is some relief in sight. We can't eat our pie and have it too.

CANADIANS INTERESTED IN ROADS

Montreal, Nov. 20—Unbounded support is being accorded the good roads movement in the Canadian province of British Columbia, and in the course of a few years that section will have one of the finest and most picturesque highways on the North American continent. Working quietly and energetically, the government, with the hearty co-operation of the various good roads and motoring organizations, has accomplished much and has outlined a campaign for improved highways that will keep the province in the foreground in the good roads movement for years to come.

During the annual meeting of the Pacific Highway Association, held in Portland on August 4 and 5, at which time J. T. Ronald was re-elected president and Frank M. Fretwell re-elected secretary, reports were received on highway work under way and projected on the western coast. Of no small importance was the report of A. E. Todd, of Victoria, which brought to light a most encouraging state of affairs as regards good roads.

Nowhere on the coast is the Pacific highway, which extends from Vancouver, B. C., to Tia Juana, Mexico, a distance of 2,009 miles, given more enthusiastic support than is accorded in British Columbia. Said Mr. Todd: "While the highway, as it exists today, is continuous from Vancouver across Washington, Oregon and California, into Tia Juana, it will be but a short time until the Pacific highway will extend northerly from British Columbia to the town of Hazelton, which is 80 miles from the Alaska boundary. An extension of this road to Stewart, which is situated on the Portland canal, right at the Alaska border line, will follow shortly."

Not only are the residents of British Columbia strong boosters for the highway, but the government also is doing all in its power to further the movement. Assurances have been received that the Hazelton project would be rushed to completion in the shortest time possible, and these pledges are being carried out as rapidly as the difficulties of construction through a comparatively unset country will permit.

Five million dollars was spent on the roads and highways of British Columbia during the past year; in the present year in the neighborhood of \$5,000,000 will be expended in constructing new thoroughfares and improving existing ones, and for the 4 years, 1910 to 1913 inclusive, a grand total of about \$20,000,000 will have been poured through these channels. Add to this enormous appropriation the existing roads and the spirit of co-operation on all sides, and you have a combination that cannot help but give British Columbia a system of roads unexcelled in North America.

Of the most interest to the Washingtonians is, of course, the Pacific highway through British Columbia. However, there also is being built a trunk road from the west to the east, connecting with the Canadian highway which extends from Lake Superior to the Pacific coast. In view of the fact that the Canadian highway will be but 50 miles from the international boundary line, and in many places not more than 10 miles north of the American side, it is expected that Americans will make much use of it. At numerous points it connects with the road systems of Washington and Idaho.

From Vancouver, B. C., to Winnipeg, Manitoba, there is unanimous sentiment in favor of the Canadian highway, and each province already has pledged to construct its part of the system. In the eastern Canadian provinces a strong campaign is being waged for an extension to Montreal and there are bright hopes of success in this direction.

TO IMPROVE OMAHA TRACK

Sioux City, Ia., Nov. 20—At a meeting of the Sioux City Automobile Club last week it was decided to push all improvements on the new speedway to be constructed here and have them completed by July 1. The committee was instructed to obtain estimates on grading for a saucer-shaped mile track, on an 8-foot grade and on a 12-foot grade, and also for an oblong track with grades, on the curves, of 8 feet and 12 feet. Among other improvements, a club house will be built at the speedway.

George O. Jamesson resigned as president of the club, as he moved to Des Moines. C. S. Douglas, of the Nebraska Buick Automobile Co., was elected to succeed him. F. H. Reid was elected secretary to fill a vacancy caused by the resignation of C. S. Douglas. There is some talk here of promoting a circuit of races, taking in Omaha, Lincoln, Sioux Falls and Sioux City.

Makers' Views on Gasoline

EDITOR'S NOTE—Articles on gasoline which are appearing in the columns of Motor Age have caused comment among car manufacturers, some of whom express their views on the subject as follows:

INDIANAPOLIS, Ind.—Editor Motor Age

—When we first started to race cars, we attempted to use a higher test gasoline than the 62 to 64 test that is ordinarily used, but quickly discovered that the higher test gasoline would not give the speed to the car that the regular commercial variety did. That led us to experiment with still lower tests, and we found that the commercial naphtha, 56 to 57 test, at 7 cents a gallon would average 1 or 2 seconds faster to a lap on our speedway here than the regular 62 test. We have used the naphtha to a considerable extent for our car-testing, but find that we have greater deposits of carbon with it, and that it is very much more difficult to start in cold weather. A car's performance with it is always slightly better than with the regular grade of gasoline.—Nordyke & Marmon Co., Howard Marmon.

Low Gravity Hard to Classify

Buffalo, N. Y.—Editor Motor Age—I have not much to say in regard to the low-gravity gasoline. It is quite true that when the engine is running in the test room with a temperature about 70 degrees Fahrenheit, that more power can be gotten out of an engine with about 58 to 60 gravity than with 70 to 76. I think that this would not hold good on the road, especially in cold weather, as there is scarcely any carburetor made that will thoroughly gasify the low-gravity gasoline at present on the market. It is a very difficult matter to start the car and also to get a thoroughly good mixture, especially for low speeds, with this low-gravity gasoline. With the 76, there is no difficulty, and the all-around results are much better. We have to surround our carburetors with a much larger waterjacket now than was necessary a while ago. If the gasoline gravity is going to get much lower, we will have to put in still larger waterjackets.—Pierce-Arrow Motor Car Co., D. Fergusson.

Lozier Favors Low-Gravity

Detroit, Mich.—Editor Motor Age—Our experience with gasoline during the past 5 years in which Lozier cars have taken part in long-distance races and endurance tests has taught us that gasoline of low specific gravity has produced more satisfactory results than the higher grades of gasoline or naphtha, and we discovered a number of years ago that the impression which existed that better results were obtained from gasoline of 76 and 80 test

was a mistaken one and that when lower grades of gasoline were used, greater power was obtained.

We finally adopted gasoline of 68 specific gravity, preferring not to go below this on account of fear of impurities, although we believe that even better results could be obtained with even lower grades. Naturally, the gasoline of low gravity caused a little more trouble in starting, but just as soon as the motor had warmed up, the carburation and ignition was perfect.

Our racing experience with gasoline, supplemented by our experience in normal road work, has demonstrated that with proper warm air and hot-water carburetor attachments, low-gravity gasoline produces the best results.—Lozier Motor Co., C. A. Emise.

Makes Carburation Difficult

Syracuse, N. Y.—Editor Motor Age—Regarding the subject of gasoline, of course we are aware that year by year the gasoline which we are getting is of lower and lower gravity, and while the lower gravity may have more heat units in it the difficulties of carburation are becoming so great, especially in cold weather, that we would cheerfully give up the heat units if we could get a grade that evaporated a little easier.—H. H. Franklin Mfg. Co., John Wilkinson, consulting engineer.

National Uses 68

Indianapolis, Ind.—Editor Motor Age—Regarding our experience in contest work with gasoline, will say we have used in our contests gasoline at varying gravity from 54 to 86. We find, however, that as a general rule we get as good or better results from 68 than we get from any other specific gravity. We find very frequently that 72 is as good as 68, but in reality the only difference we observe between 72 and 68 for contest work is the fact that the 72 seems to be a little cleaner than the 68. As a result of our diversified experience with the different grades of gasoline we have some time past been using 68 in all of our contest work.—National Motor Vehicle Co., George M. Dickson, secretary.

OHIOANS AFTER A. A. A. CONTROL

Cincinnati, O., Nov. 20—A movement was today inaugurated in Ohio State Automobile Association circles, headed by Dr. Charles L. Bonifield, to get control of the American Automobile Association meeting in New York, December 5, on account of the alleged monopoly of power in favor of New York interests against that of the interests of the central states. No details have been announced.

NEW York—Editor Motor Age—In Motor Age issue of November 2 on page 31 is published an article entitled "Shall Hand Spark Control Be Retained?" It is in the nature of a reprint from *Omnia*, evidently inspired by a foreign manufacturer, who has been unable to perfect an automatic control system and who is endeavoring to discredit our automatic control, and push forward his twin-plug system. This article is laughably erroneous in a great many respects and very easily refuted.

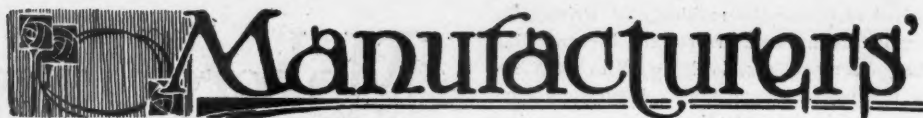
In the first place the originator of this article bases his arguments, which he very frequently contradicts, upon two points; first, that there is a certain loss of time in the complete combustion of a given charge of gas after the initial spark has been fired in the cylinder; second, that there is a loss of time in the transmitting of the spark to the spark plug after the current has first been set up which produces this spark. Both of these assumptions are correct, but one is of so little importance as to be a negative quantity and the other is of such a nature as to offer only added complications in an effort to overcome it.

The variation in time of the complete combustion of a compressed gas from the instant of the first spark varies of course in the different type motors. In a T-head motor with only one spark plug the loss of time, by a great stretch of the imagination, may be figured. In a valve-in-the-head motor there is practically no difference.

Marked by Simplicity

The greatest mechanical developments are marked only by increased simplicity. This being true, it is hard to estimate any value in doubling up the spark plugs and the necessary wiring of a motor to supply two sets of spark plugs to overcome the slight loss of time in the burning of the charge as outlined above. In other words, the loss of power, if there is any appreciable loss, resulting from the fact that a recess of gas is thoroughly consumed by means of concentric flames starting from the spark, is so minute and so unimportant that it is silly to complicate your engine by adding another set of plugs to attempt to do anything with this condition. It would be almost as sensible to put eight wheels on a car instead of four because you are running the danger of having one a puncture or a blow-out. When you put your eight wheels on instead of having a chance of puncturing one of four tires, you have twice the chance of puncturing one of eight tires.

There would be more sense in paying attention to this condition if the spark were thin and small, than if the spark were hot and fat. If, in other words, at slow engine speed with the magneto in retard position, as in the case of some inferior magnetos, your spark is very weak there might be some logic in this argument, but the fact that the Eisemann ignition gives a hot, fat spark, even at full retard, minimizes the importance of this problem so greatly that it is silly to consider it.



Official of Eisemann Magneto Co. Replies to Article on "Shall Hand Spark Control Be Retained"—Claim Made That Foreigner's Assertions Are Erroneous

This article then goes on to lay stress upon the fact that there is time lost between what it chooses to call the apparent ignition and the real ignition, that is the time is lost between the moment when the magneto distributor is on contact and the moment that the spark actually occurs. This, too, is about the silliest hypothesis that could be imagined, for the reason that electricity travels at a speed of 187,000 miles per second; even granted that the hysteresis of the magneto circuit, the induction of the electric circuit, and the electric capacity of the condenser all enter into the transmission of the current it is easy to see that the current would still travel somewhere around 100,000 miles per second, which ought to be fast enough to take care of any internal condition of ignition. As a matter of fact this article later on minimizes the value of this fact by saying "there remains only to be taken care of the time lost in producing the spark, which is easy to do, as it is proportional to the engine speed."

As a matter of fact neither one of these conditions is of sufficient importance to warrant consideration. The all-important point to be considered is this, that the proper timing of the spark is absolutely proportional to the engine speed, and that, varying as it does constantly with the engine speed, it is impossible for any human being by the senses of hearing and touch to vary this timing accurately so that you are getting perfect combustion all the time. No matter how expert a man may be he never attempts to change the location of his spark with every variation of engine speed and as a result he is always getting improper timing. Practically the only time that the spark is changed is when the variation is so great that extreme loss of power or a knock in the engine develops, while in reality it is the small and constant variations that go to make up the big loss of power and wasted gasoline.

Must Vary Spark Location

It wouldn't make any difference whether you had one spark plug or four spark plugs in your cylinder to hasten the burning of the mixture, there would still be ever present the absolute necessity of varying the location of the spark with the variations of the engine speed. So that with your twin ignition system you still do not solve the problem of proper timing of your engine. In fact this article admits that a fixed advance is not the right system, and thereby admitting our claims that it is necessary to have the advance and retard change with varying engine conditions.

And now another very important point—the manufacturer responsible for the article in question says in one booklet, "It is not always possible to provide locations for two spark plugs in a cylinder, however, or to arrange for two shafts by which the magneto and battery timer may be driven," and in still another booklet he says, "It must be emphasized that the success of the system is dependent very largely on the location of the spark plugs," in which he is commenting on multi-point ignition. In other words, the father of the article published admits that the system which the article commends is to say the least faulty and impractical.

Denial of Assertion

In the same article the statement is made that the magneto with the automatic advance would be perfect if the necessary advance were in all cases proportioned to the engine speed, but that this is not the case and that the advance is variable with the numerous conditions of the intake. We have shown clearly and can demonstrate even more clearly by actual practice that the variation of the intake is so small as to be a negligible quantity, so that the conclusion drawn from the article must be that the automatic system is perfect. Again, in this article the statement is made that the automatic magnetos do not seem to be popular. In controversion of this statement it is only necessary to say that there are at least a dozen concerns abroad that have been using this system for some time and that, although it has but just been introduced in this country, there are a dozen concerns in America using it.

When you stop to consider the fact that necessarily the system is a little more expensive than the less efficient systems, it would seem that in the short space of time that the apparatus has been on the market, that it is extremely popular. Quoting again from the article, "In recapitulating it is noted that the spark advance is essential and it has to be operated by the driver." There has been nothing said in this article and nothing said by the expert engineers throughout the world which would allow any supposition as this to be tenable. In direct opposition to the truth of this is the admitted statement by the leading engineers in the industry that a hand operated spark advance is something urgently necessary to be dispensed with and with the development of the Eisemann automatic advance ignition we have enabled the abolishing of this much to be despised system of hand control.

The one point remaining to make auto-

Communications

Bosch Company Declares Accurate Timing of Magneto Is Important Factor in Engine Efficiency and Tells How To Bring It About

matic advance and retard perfect, when experiments along this line first began, was that of simplicity. Dozens of types of automatic advance were made and experimented with, but discarded eventually because of their complications and uncertainty.

While we have answered the communication largely on theory, we wish to emphasize the fact that our statements contained herein are not based on theory alone, but on the positive experience of capable engineers.—Eisemann Magneto Co., W. E. Steinback.

TIMING THE MAGNETO

New York—Editor Motor Age—The accurate timing of a magneto is an important factor in the efficient operation of gas engines, and must be studied with considerable care. No cut and dried rule can be established for timing, inasmuch as the ignition point varies according to peculiarities and characteristics of the individual engine.

It has been stated that the correct point of ignition is one-eighth of the engine stroke; thus, for an engine of 5-inch stroke the ignition advance should be $\frac{5}{8}$ inch before top dead center.

It is quite true that some engines of 5-inch stroke require an advance of $\frac{5}{8}$ inch, but it is equally true that with other 5-inch stroke engines an advance of $\frac{5}{8}$ inch would be quite incorrect.

If an engine is so constructed that the combustion space is compact, the required advance would be considerably less than the proper advance for an engine in which the combustion space is considerably extended.

The normal speed of the engine is one of the great factors in establishing the ignition point, for it goes without saying that a far greater advance is required for an engine running at 1,200 revolutions per minute than for an engine running at 600.

Another factor that must be considered is the stroke of the engine, for the longer the stroke the greater must be the advance, other conditions being equal. Thus, an engine of 5-inch bore and 7-inch stroke will require a greater ignition advance than an engine of 5-inch bore and only 5-inch stroke.

Another consideration will be the location of the spark plug. If this is located in the center of the combustion space, and with its point projecting into the mixture, a small advance will be required, whereas if the plug is located on one side of the combustion space and is

possibly pocketed, the advance required will be far greater. The exact advance for maximum efficiency can be determined only by experiment.

In timing a magneto of the usual rotating armature type, fair all-around results may be obtained by so setting it that in the full retard position it gives its spark at the instant when the piston is at top dead center. Whether or not the advance position will be correct can be determined only by trial, and if it is found not to be so, the relation of the armature to the crankshaft can be altered in accordance with carefully noted tests until the results are satisfactory to the driver of the car.

Another statement that is made is that if a user of an engine desires to have it throttled down to a very low speed, the spark plug points should be opened up until they are fully 1-16 of an inch apart.

This statement is exactly contrary to the actual conditions. When a magneto runs at low speed, as will be the case when the engine is throttled down, it does not produce a current of as high a voltage as will be the case when it operates at increased speed, and in consequence the current will not be able to jump across as wide a spark gap. Thus, if it is desired to throttle an engine down low, the spark gap must be much smaller than is required for higher speeds. For high-tension magneto ignition 1-50 of an inch spark gap will give correct results for all normal operating speeds. Engine characteristics have some influence on the size of the spark gap, but in no case should this gap be greater than 1-32 of an inch.—Roger B. Whitman, Bosch Magneto Co.

FUTURE OF THE INDUSTRY

Detroit, Mich.—Editor Motor Age—A discussion relative to the future of the motor industry by those familiar with the present condition of car selling and manufacturing inevitably leads to one conclusion, namely, that the future history of the industry will not differ from the history of the sale and manufacture of other commercial articles which have become necessities in the everyday life and business of the nation.

Farm implements, locomotives, electric motors, street cars, typewriters and sewing machines have become established articles of commerce and millions of dollars of capital are employed in their manufacture and sale. The future of these industries has long ceased to be a matter for speculation with the business world—they are ac-

cepted as fixed and permanent manufacturing enterprises.

The motor car has, in the same manner, become a fixed industry of the world, and the demand has reached colossal proportions. The business of manufacturing and selling cars has reached that of any other line of manufactured product and it is only because of the fact that the growth of the industry has been so rapid and so phenomenal and of such comparatively recent date that speculation has been indulged in by many as to whether or not the industry will become permanent.

It would seem unnecessary to discuss the question were it not for the fact that there are many who thoughtlessly look upon the motor car as a fad or a craze. Nothing could be farther from the truth, for it must be realized by all that this is the age of rapid transit and the practical need for motor cars is so great and so universal that it is inconceivable that there can be any lessening in the demand. On the contrary, the use of motor cars will increase until they are almost universal.

The industry, up to the present time, has been largely one of manufacturing pleasure cars. The immense possibilities of the future lie not only in this direction, but in universal transportation of freight by motor cars. It is not difficult to predict that freight and passenger transportation by motor car will in time reach proportions beyond the present established facilities for transportation by water and rail.

An industry so colossal and with such a stupendous future will inevitably witness many changes, but that the industry itself will continue to expand and grow to even greater magnitude is beyond doubt. As a comparatively new industry apparently offering great financial returns upon the investment, many irresponsible concerns have been attracted to the building of motor cars. This is always the case in any new line of manufacturing. It is obviously impossible to predict the success or failure of individual concerns, yet it is even now possible to determine with reasonable certainty, a large number of motor car builders who will, in a large measure, shape the course of the motor car industry in the future.

The building of motor cars in a legitimate manner involves such large capital that management of these enterprises and the details of their conduct are necessarily entrusted to men of calm business judgment who have carefully analyzed the situation and who realize that the manufacture of motor cars has become a permanent and important part of the industries of the nation. The motor business will never witness a cataclysm; weak concerns may fall by the process of elimination, but strong ones will take their place. The great magnitude of the industry has placed it in safe hands and established it on a firm foundation.—Lozier Motor Co., F. C. Chandler, sales manager.

A WELL-DESIGNED GARAGE.

Correspondent Describes Fireproof Car Station in Wisconsin Town

MILWAUKEE, WIS.—Editor Motor Age—It may interest some of your readers to get some general information on the garage in a Wisconsin town, and for this purpose two illustrations of the public garage of James W. Menhall Automobile Co., Beloit, Wis., are given herewith in Fig. 1 and Fig. 2.

In addition to conducting a public garage for taking care of the locally owned vehicles, the proprietor is distributor of the Brush car and local agent for the Hudson and Marion lines. The garage is fireproof and is practically a monolith of reinforced concrete. It has ground dimensions

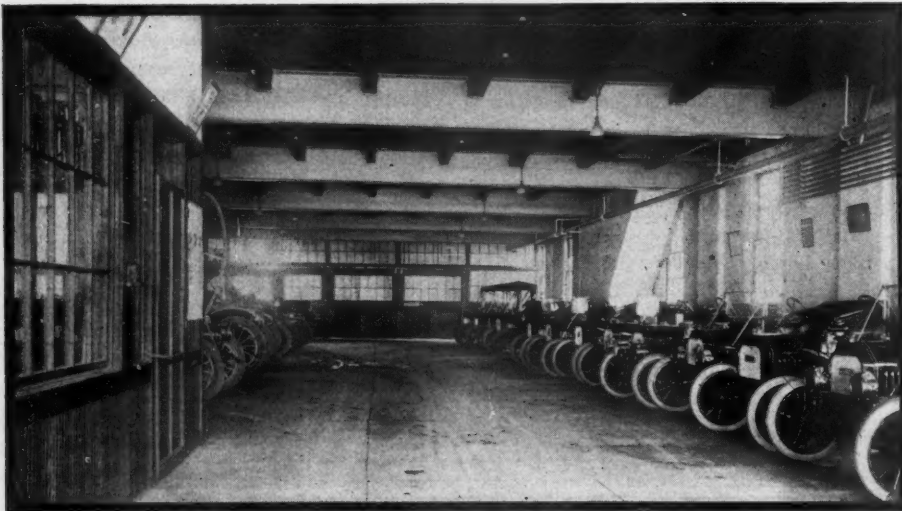


FIG. 1—INTERIOR OF MENHALL GARAGE AT BELOIT, WIS.

of 44 by 130 feet and is two stories high. The exterior is finished in granite effect, produced by a combination of the whitest cement obtainable, with black and green granite mixed in. The tile embellishments and roofing and the beams are finished in green. The interior is in green and white and the woodwork in mission style.

The garage occupies the entire first floor. This floor is unobstructed by pillars or posts and provides storage space for approximately fifty touring cars or a correspondingly larger number of small cars. At the left of the front entrance spaces are partitioned off for office and stock rooms. The administration office is 8 by 12 feet in size and the stock or supply room is 12 by 16 feet.

The repair shop, which accommodates eight cars at one time, is situated at the rear of the first floor, partitioned off from the main garage by fireproof sliding doors. The shop occupies a space of 24 by 31 feet. It is equipped with a full complement of machine tools, benches, lathes, etc.

The latest Bowser system of gasoline and oil storage has been installed and compressed air for tire inflation is available at three different points on the main garage floor. There are several rows of steel lockers for the accommodation of patrons and



ample toilet facilities. The cost of the building is \$30,000. The architect is F. H. Kemp, of Kemp & Miller, Beloit, Wis.—L. E. M.

QUESTION OF GEAR RATIOS

Portland, N. D.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—What is the gear ratio of the Buick model 10?

2—What would be the gear ratio if I put a set of 34-inch wheels in place of the

30 by 3½? Would it require a much more powerful motor?

3—I have some trouble with my motor missing on intermediate speed only or when pulling lightly. If I pull off to the side of the road or go up a hill it never misses, but going down hill or if I want to speed up it misses very badly and sometimes stops. There seems to be nothing wrong with the adjustment of either the ignition or the carburetor. What does Motor Age think is the cause of this missing?—Subscriber.

1—The Buick model 10 has a gear ratio of 3 to 1.

2—By gear ratio is meant the number of revolutions of the crankshaft to one of the rear wheels, consequently if no change is made in the bevel driving pinion in the rear axles and the bevel gear on the differential with which it meshes, there is no change in the gear ratio when the size of the wheels is changed. There is a difference, however, in the work required of the motor, for the car will travel forward about 2 feet further in each revolution with 34-inch wheels than with 30-inch wheels. So there is more resistance to the motor. It would require a slightly more powerful motor to give the car the same hill-climbing ability as it had before, but

The Readers'

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

you probably would have a somewhat speedier car on the level with good roads.

3—Your trouble is most probably due to an air leak, either around the connections of the inlet manifold to the cylinders or carburetor, in the inlet manifold itself, or through the valves or valve-stem guides. A defective gasket or loose joint is most likely the cause. The best way to test for this trouble is to bind all such connections with cloths saturated in gasoline while the motor is running idle and missing. When the missing ceases, the trouble is found. There also may be a leak around the spark plugs. If the missing is most noticeable at low speeds this foregoing is very likely the cause of the missing—that is, providing the carburetor is correctly adjusted. Should this miss only occur at high speeds, either the mixture is too rich or the distributor is worn so that the revolving contact jumps the metal segment at times without making good electrical contact.

PACKING BLOWS OUT

La Junta, Colo.—Editor Motor Age—I have a 4-horsepower International engine which blows the packing out around the head. I have used all kinds of packing but have not been able to make any of them stay in over 2 weeks. Can Motor Age tell me of any packing I can get which will hold, and where I can get it?—W. T. Best.

It would seem from your inquiry that the packing referred to is around the valves. If this is the case, good copper or asbestos gaskets should hold indefinitely. If the blowout continues with these screwed down tightly, Motor Age would suggest that you try coating the gaskets with red lead. If it is not the packing around the valves that you refer to, Motor Age would suggest that you send a sketch showing just where the blowout occurs.

MIXING KEROSENE AND GASOLINE

Cheyenne Wells, Colo.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—Are there any harmful results to an engine from using a low-test gasoline, so low as 59?

2—Would gasoline with kerosene mixed

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

in it be harmful and would it carbonize the cylinders sooner than purer gasoline? —C. R. Hedlund.

1—No; the only difficulty is that starting is usually more difficult than with the higher grades. You are referred to the series of articles entitled "Gasoline" running in another department, the fourth of which series appears this week.

2—It is harmful only in that starting is made harder and carbonization of the cylinders and fouling of the spark plugs are worse. Just how much worse depends upon the percentage of kerosene used.

WANTS TO BE RACE DRIVER

Butler, Pa.—Through the Readers' Clearing House kindly answer the following questions:

1—I am a young man and would like to get into the racing game. What would be my best and quickest way of doing so?

2—Give me the names of the different agencies in New York and Chicago, and state what cars each sell.—H. R.

1. The surest way to get into racing is to secure employment in the testing department of a factory. This usually presupposes a thorough acquaintance with the car obtained by actual work in the factory. A more expensive and less certain method is to purchase a high-powered car and go in for amateur races. If a mark is made in these, graduation into the ranks of the professionals is almost sure to follow.

2. Such a list would require too much space and would not be correct for any length of time as the agencies are continually changing. The Auto Directories Co., 1717 Broadway, New York, publishes lists of the dealers in different localities.

TROUBLED WITH CARBON

Chicago—Editor Motor Age—I experience considerable difficulty from valves becoming caked with carbon which necessitates considerable grinding in order to keep the motor in good shape. Can Motor Age tell me the causes leading up to carbonizing of the spring-operated poppet valves and suggest a remedy for my difficulty?—E. S. W.

The most frequent cause of carbon deposits in the cylinder and on the valves is that the cylinders either get too much oil or oil of a heavy or inferior grade. A portion of it will work up past the pistons

where it will be consumed by the heat of explosion and leave a deposit of carbon. This may also be caused by the use of a too rich mixture.

Look for the latter trouble first, as a correct adjustment of the carbureter may improve the operation of the motor in other ways in addition to the elimination of the carbonizing. Try a better grade of oil, after cleaning out the carbon and grinding the valves. With the proper adjustment of the carbureter and the proper oil you should have no further difficulty from carbon.

CAUSE OF FLAT TIRES

Loup City, Neb.—Editor Motor Age—What would be the cause of the tires on a car being flat? They have been kept well inflated and the car has not been used for a couple of weeks. Has the cold anything to do with it?—E. B. Taylor.

Rubber tires cannot be made absolutely air-proof, and there is bound to be a slight

LIKES MASTER VIBRATORS

Ohioan Suggests Method of Improving Ignition of the Motor

Collinwood, O.—Editor Motor Age—I notice in the Readers' Clearing House of November 9 issue that A. D. Carpenter has had trouble with his vibrators. I would recommend him, and also A. K. B., of Madison, Ga., to install a master vibrator. I have installed about fifty master vibrators in the past and in every case the motor has shown a wonderful increase of power. One case in particular where a Continental 45-horsepower motor was installed in a motor boat, where the load is constant, the motor showed an increase of about ninety revolutions per minute.

Absolute synchronism, which means a spark produced in every cylinder in exactly the same angular position of the crankshaft, is an impossibility even by an expert with an ordinary spark coil. The only way to adjust spark coils anywhere, near together, is by the sound of the vibrators, and should one spring be stiffer or heavier than the others it will consume more current.

With a master vibrator, which is nothing more than one vibrator and one condenser



FIG. 2—UNUSUAL EFFECT IN ENTRANCE OF CONCRETE GARAGE

leakage of air at all times. One of the most frequent causes of a slow leak is due to the improper seating of a valve, although there often is a leak in the rubber itself. Sometimes the passage of air from the tires is so slow it will hardly be noticeable in several months, but it is nearly always present. The practice of allowing the weight of the car to come on the tires while it is standing in the garage will probably account for the rapidity of the leak in them. The cold weather does not have any appreciable effect on the rate of flattening of the tires. If anything, the leakage should be slightly less in cold weather than when the air is warm.

for all the cylinders, you have the same hot, fat spark in every cylinder at exactly the right time with the least expenditure of battery current. The master vibrator will run your motor on batteries which would not work an ordinary coil, and will permit slower running on high gear. The cost of a master vibrator is nothing as compared with a high-tension magneto and will give equally good results. As a rule, after the first adjustment of the master vibrator to draw about 1 ampere, it will need no more attention than a first-class magneto.

Motor car owners who install a master vibrator will be surprised to find from 10



FIG. 3—MOTOR CAR MOVES WISCONSIN POSTOFFICE

to 25 per cent more power at their command. A master vibrator can be used on any old coil, as by short-circuiting the vibrator terminals with a piece of wire the old vibrator can be thrown away.—Thomas A. Seymour.

MOVES POST-OFFICE BY MOTOR

Sauk City, Wis.—Editor Motor Age—The photograph, Fig 3, shows how our old post-office was moved to make room for a new building. The motor car which moved the building is my two-cylinder, 16-horsepower Pope-Toledo, and which I drove myself. I have often noticed in the columns of Motor Age illustrations of cars hauling mail, etc., and in fact there are many in use today, but where else is a motor car that hauls mail, post-office, and all!—Theo Decot.

NATIONALITY OF CARS

Buhler, Kans.—Editor Motor Age—Through the Readers' Clearing House kindly inform me at what places in their respective nations are the following motor cars built:

1—England: Marlborough, Talbot, Vulcan, Adams, Standard, Crowdy, Belsize, Vauxhall, Alldays, Brown, Lanchester, Rolls-Royce, Thornycroft, Dennis, Hillman.

2—Scotland: Argyll.

3—Belgium: Metallurgique, Germain, Imperia, LeGui, Minerva.

J. Frank Freisen.

1—Marlborough Car Co., Ltd., 8 Great Marlborough street, London; Talbot, Clement-Talbot, Ltd., Barby road, Ladbroke Grove, London; Vulcan, Vulcan Motor and Engineering Co., Southport; Adams, Adams Mfg. Co., Ltd., 102 New Bond street, London; Standard, Standard Motor Co., Coventry; Crowdy, Crowdy, Ltd., Olaf street, Notting Hill, London; Belsize, Belsize Motors, Ltd., Clayton, Manchester; Vauxhall, Vauxhall Motors, Ltd., 180 Great Portland street, London; Alldays, Alldays & Onions, Ltd., Great Western Works, Birmingham; Brown, Brown, Bros., Ltd., Great

Eastern street, London; Lanchester, Lanchester Motor Co., Armourer Mills, Sparkbrook; Rolls-Royce, Rolls-Royce, Ltd., 14-15 Conduit street, London; Thornycroft, J. I. Thornycroft & Co., Ltd., Caxton House, Westminster, London; Dennis, Dennis Brothers, Guilford; Hillman, Hillman Motor Car Co., Coventry.

2—Argyll, Argylls, Ltd., Glasgow, Scotland.

3—Germain, Germain Co., Monceau-Sur-Sambre, Belgium; LeGui, E. Nicolas, 10 Rue de Metz, Courbevoie; Minerva, Minerva Motors, Ltd., Rue de la Pepiniere, Anvers, Belgium.

4—Motor Age is not in possession of the other addresses you wish.

KEROSENE FOR COOLING

Kirkwood, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—Is Motor Age sure that it answered L. M. Robinson correctly in regard to the 1912 Chalmers ignition system?

2—Would kerosene be a possible solution of the anti-freezing mixture?

3—Would it be possible to use it at all?—G. A. Welch.

1—Motor Age was only partially correct in the reply to which you refer. The Chalmers 30 uses Splitdorf magneto; Bosch dual on the other models.

NOTICE TO READERS

Motor Age has received communications addressed to the Readers' Clearing House from the following named towns and nom de plumes:

Shreveport, La.—Reader.

Grafton, Wis.—F. N.

Lawrence, Kans.—A Reader.

Jackson Center, O.—C. B.

These communications will be held until the proper signatures have been received. All communications written over a nom de plume must bear the writer's signature, otherwise such communication will not be answered. These signatures are wanted as proof of the authenticity of the inquiries.—Editor Motor Age.

2—Yes; this was discussed in answer to E. J. Bartz, in the Readers' Clearing House, last week. Kerosene has been found to work very satisfactorily as an anti-freezing solution in the cooling system. The rubber hose connections will probably have to be replaced once or twice during the season, unless previously dipped in shellac, which prevents the oil from rotting the rubber. Also, kerosene has a tendency to cause the motor to heat up more than does water, but usually not enough to hurt in cold weather.

3—See answer to question 2.

TUNING UP FOR RACE

Mayville, N. D.—Editor Motor Age—Will Motor Age kindly answer the following questions:

1—How does the self-starter on the 1912 model Cadillac work? Does this car have a high-tension magneto or does the motor dynamo do the igniting?

2—Please give a diagram showing the air distributor used on the self-starters recently brought out by the Chalmers company.

3—Before entering a race what adjustments should be made to secure the highest possible speed? This question does not apply to any particular make, but to any four-cylinder car of about 4 by 4½ bore and stroke.

4—I have been reading with interest the discussion printed in recent numbers of Motor Age, concerning the relative merits of battery and magneto ignition. Very good arguments have been set forth in favor of both sides, but nevertheless I am not convinced that either side is wholly in the right, or wholly in the wrong. Let me set forth my experiences. For three years I have driven my car, equipped with a Bosch magneto, a distance of 15,000 or 18,000 miles, during which time my magneto has not cost me 1 cent for upkeep. I believe that anybody else can do the same stunt if they will keep their magneto oiled, keep the brushes clean, and the rest of the time keep their fingers off. Now, in regard to my battery: I keep a storage battery in my car, which I use for starting only. I charge this battery twice a season, at a cost of 50 cents a charge, and then I forget my whole ignition system, except for cleaning the spark plugs occasionally. Thus it costs me just \$1 a year to ignite my car and no \$25 for magneto upkeep, or \$10 to \$15 for battery-charging.—Royal Nibs.

1—The self-starting device employed on the 1912 Cadillac cars is part of an electric system of starting, ignition and lighting combined. It is the product of the Dayton Engineering Laboratories Co., Dayton, O., and is known as the Delco System. In brief, the plant consists of a dynamo which is operated as a generator by the engine to charge the storage battery, and automatically transformed into a motor for starting the engine, the current to operate it as a motor being supplied by the storage battery. The system was described and

illustrated in detail in *Motor Age*, October 5.

2—The air-distributor used on the Chalmers, 36 for 1912 is illustrated in Fig. 4. It consists of a steel disk W, inside of an air-tight case. The disk is connected to the oil-pump shaft by the shaft Y and revolves in a horizontal plane. In the disk is a slot or port Y. Air coming into the distributor from the storage tank enters the air chamber above the revolving disk. This passes through the port X into the cylinder pipe which is uncovered as the disk revolves.

As it is positively geared, the disk opens the different ports in their proper order so the cylinder which is ready for the working stroke receives the charge of air in the order of firing, just as the ignition of the cylinders is controlled by a commutator. The distributor disk is the only moving part of the system, and except during the starting operation revolves idly on its seat, which is lubricated by a grease cup Z. The disk is held in place by a ball and spring V which are controlled by the nut at the top of the distributor. The system was described in detail in *Motor Age*, July 13.

3—What comprises the necessary adjustments of a car in preparation for a race depends to a certain extent upon the condition of the car before the process of tuning up is begun. There are, however, certain parts that are looked to and certain adjustments made in all cases where it is desired to get the greatest possible speed. It is seen that the greatest compression is obtained, which nearly always means grinding the valves and fitting new piston rings. It may also mean reboring the cylinders and fitting new pistons. The valves and ignition are correctly timed, new springs and gears fitted if necessary, new bearings put in, wear taken up in every part, fuel, ignition and water connections tightened up and made solid and all parts that show wear or looseness repaired or replaced. The lubrication system is given specially careful attention.

PRaises INNER SLEEVES

Grand Rapids, Mich.—Editor *Motor Age*—Having read many opinions on inner sleeves or shoes, I would like to state my successful experience with them for the benefit of other readers. I used them after my casing got weak, say for 5,000 miles. Some people have said the casings are too small, but after running that many miles they are stretched considerably, so that, according to my thinking, it is a help to the tire and to the purse. The kind I am using are the disk between five or six-ply canvas. I have driven a delivery car for 5 years and find them a success.—W. Vlasblom.

PROBABLY CONNECTING-ROD KNOCK

Glenburn, N. D.—Editor *Motor Age*—I have a model T Ford which runs nicely when the car glides along, like going down hill, or when the engine does not have to work; otherwise it develops a sharp knock. I have cleaned the carbon out, without

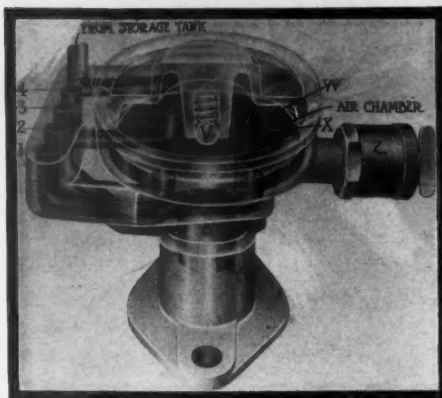


FIG. 4—DISTRIBUTER OF CHALMERS STARTER

any relief. The engine is hard to start at first, but after starting runs well. It can climb any hill on high. It is fitted with a Kingston carburetor and Girex mixer. The valves have just been reground. I notice about $\frac{1}{4}$ -inch space between the end of the top piston ring, although the compression seems good. Will *Motor Age* inform me what is the cause of the knock?—J. E. Thayer.

It is probable the knock you describe is due to a loose connecting rod. This can be eliminated by removing one of the shims on each side of the lower bearing of the connecting rod. In case there are no shims in the connecting rod bearing, or this knock is not eliminated, a new connecting-rod bushing will be necessary. It may be that the knock is due to a piston-pin bearing, although such a knock is more metallic and sharper than the dull sound caused by a connecting-rod knock proper.

CHEAPEST SIX-CYLINDER

La Grange, Wis.—Editor *Motor Age*—Through the Readers' Clearing House will *Motor Age* answer the following questions:

1—What would be the effect of using kerosene as a cooling agent in a model F Buick, or any standard make of car?

2—What is the lowest-priced six-cylinder car on the market?

3—How long is it since the Winton company made a four-cylinder car?

4—Are there any chemicals which can be put in water to make a satisfactory cooling agent?—Charles H. Bromley.

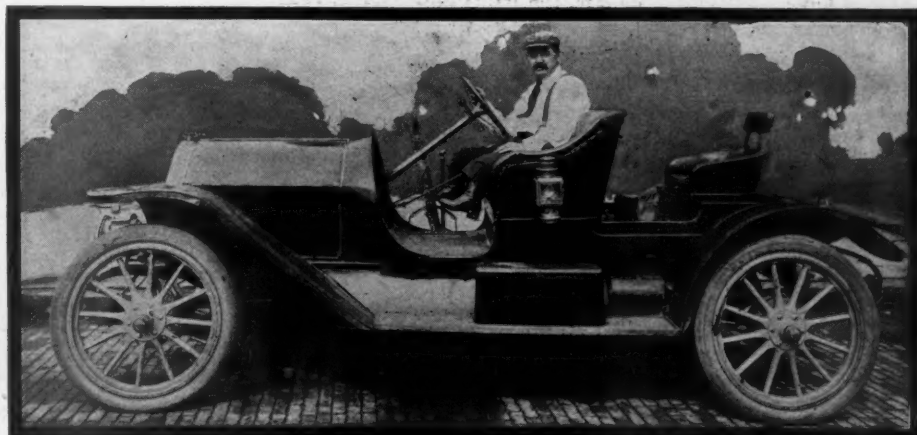


FIG. 5—HOW FOOT CONTROLS WERE CHANGED IN LEGLESS MAN'S CAR

1—See reply to G. A. Welsh in this issue.

2—Complete reports on all the cars for 1912 are not yet at hand.

3—The last four-cylinder Winton car was built in 1907.

4—Yes; alcohol, glycerine, and calcium chloride. These were discussed in the Readers' Clearing House and on pages 28 and 29, *Motor Age*, November 16.

LOOSE TORQUE ROD BOLTS

Poughkeepsie, N. Y.—Editor *Motor Age*—I have an E-M-F car and have considerable trouble in keeping tight the four bolts that secure the torsion rod to the side of the transmission case. Will *Motor Age* tell me through the Readers' Clearing House if the bolts can be fastened securely by using lock washers?—Louis P. Gillespie.

The torsion rod probably can be made to stay tight in the following way: Straighten out the connecting flange in the joint between the torsion rod and the transmission case, then put in the bolts with lock washers.

MOTOR CAR FICTION

Glen Ridge, N. J.—Editor *Motor Age*—Will *Motor Age*, through the Readers' Clearing House, give me the names of some motor car race stories, such as "The Flying Mercury" and "Stanton Wins," both written by Elinor M. Ingram.—F. B. P.

"The Girl in the Other Seat," by H. K. Webster; "Prince or Chauffeur," by Lawrence Perry, published by A. C. McClurg & Co., Chicago, and "Cynthia's Chauffeur," by Louis Tracy, published by Edward J. Clode, are two good motor car stories. None of them is a racing story, but in each the love plot centers around the motor car.

LEGLESS MAN'S CAR

Donora, Pa.—Editor *Motor Age*—The accompanying illustration, Fig. 5, shows how a motor car is used by J. E. Woods, probably the only legless driver in the country. Several years ago Woods lost both limbs above the knees. About 6 weeks ago he bought a three-passenger roadster and has driven over 800 miles in it since then. Instead of the usual clutch and brake pedals, Woods has attached hand levers of his own invention.—Reader.

SETS Good Roads Meet Dates—January 16 and 17 are the dates that have been decided upon for the federal aid good roads convention of the American Automobile Association, to be held in Washington, D. C., in conjunction with other co-operating bodies interested in highways construction and systematic maintenance.

Kentucky's Showing—The statistics of expenditures for improved roads gathered by the department of agriculture show that Kentucky's outlay in the last year was \$2,500,000. When the area of this state and the mileage of good roads already in existence are considered the amount compares favorably with the expenditures in other states.

Another Road Association—The Canadian Highway Association was formed within the past week in New Westminster, B. C., with 100 delegates from all parts of the Pacific coast and Canadian west. The convention was enthusiastic and will boost the scheme to promote the transcontinental highway north through British Columbia to Dawson City, making the longest highway in the world.

Uses Motor Car on Rails—Superintendent W. S. Williams, of the Illinois Central Railroad, with headquarters at Clinton, Ia., has placed special flanges upon the wheels of his motor car in order that he may use it on the railway tracks for inspection purposes. His car is provided with a 30-horsepower engine. The front axle has been made rigid and no derailments have been reported since he made the change upon his car.

Toledo's Speedway Project—If present plans develop, Toledo will in the near future have a motor speedway. James S. Brailey, president of the Home Telephone Co., and his brother, O. L. Brailey, are prime movers in the project. Names of other prominent Toledoans are withheld. Options have been secured on two large tracts of land, providing room for a mile track for horse racing, inside of which will be a modern speedway for motor racing. Inside the motor speedway will be provided room for circus grounds, and large buildings for fairs and like entertainments. The big undertaking will cost several hundred thousand dollars, the bulk of which has been assured.

Delaware's Good Roads Banquet—The annual banquet of the Delaware Automobile Association held last Friday night was a notable event. About 100 persons were present, mostly members, though there were a few guests, including Robert Hooper, president of the American Automobile Association; H. M. Rowe, president of the Maryland Automobile Association, and Powell Evans, president of the Automobile Club of Philadelphia, all of whom made addresses, which were largely devoted to the improvement and care of roads. Addresses were also made by T. Allen Hilles, of Wilmington, the president of the club, who acted as toastmaster;

FROM the

Charles C. Kurtz and John Baneroff, of Wilmington, and E. Greenabaum, of Seaford, Del. The dinner gave an impetus to good roads work, not only in Delaware, but also in the neighboring counties.

Race Meet Scheduled—The South Jersey Motor Club, incorporated, an organization of Philadelphia and New Jersey drivers, will hold a race meet on the York county fair grounds track, York, Pa., Thanksgiving day, Thursday, November 30. The affair will be held under the sanction of the American Automobile Association, the South Jersey club having been successful in raising the ban that had been placed on the York track by the A. A. some time ago.

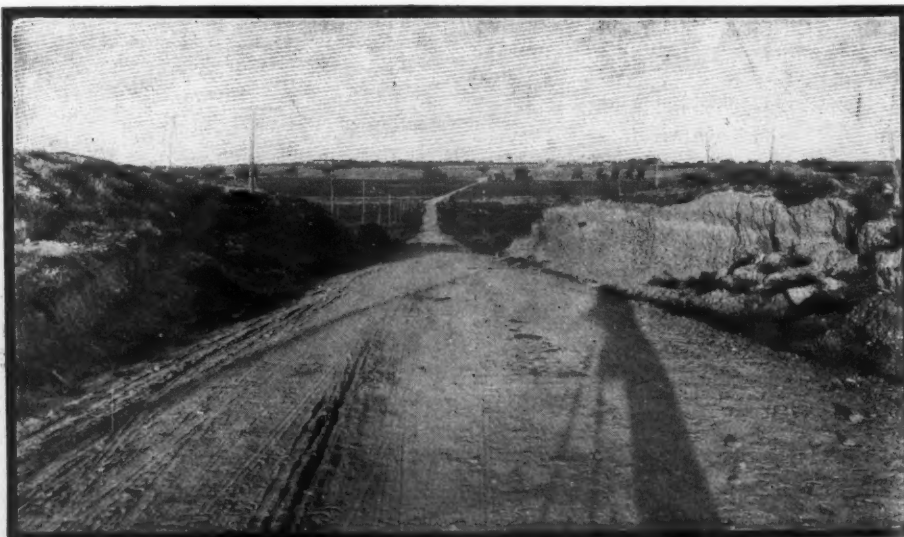
Baltimore Picks Dates—The Automobile Club of Maryland and the Baltimore Automobile Dealers' Association have decided upon February 20 to 28 for the next motor car show to be held in Baltimore. The only thing holding back for the rushing of the plans to a completion is the answer to the application of the two organizations forwarded to Major Washington Bowie, Jr., of the board of trustees of the Fifth Regiment armory for use of the armory again as the place for holding the show.

More Clubs in Pennsylvania—Secretary Paul C. Wolff of the Automobile Club of Pittsburgh, who has been very active in the rule of getting clubs into the state federation, announces that a new club, with a membership of thirty, has been formed at Belle Vernon, Pa., with Frank Steen as secretary. A new club is likely to be formed soon at Jeannette, Pa., east of Pittsburgh. Thriving clubs have been working this year at Butler, New Castle, Washington, Uniontown, Kittanning and Indiana, Pa. There are also good clubs

at Canonsburg and Mt. Pleasant, Pa., the latter being known as the Westmoreland County Automobile Club, but neither of these is affiliated with the state federation.

Against Toll Roads—"No sympathy for tollgates" seem to be the motto of Baltimoreans, for the West resolution in the city council to preserve the gate on the Reisterstown road, which was recently purchased by the city, was voted down by that body. Councilman West wanted to keep the gate and keeper's house in Druid Hill park to remind Baltimoreans of the fact that it was the last tollgate to exist within the limits of the city. It is therefore possible that those persons who wanted to make a bonfire of the gate when it was officially taken over by the city will now have their wish, though delayed, gratified.

Meeting in New Hampshire—The Manchester Automobile Association, a branch of the New Hampshire State A. A., held a meeting Saturday night at which Governor Robert P. Bass, of New Hampshire, A. G. Batchelder, of New York, representing the A. A. A., President Lewis R. Speare of the Massachusetts State A. A., and H. C. Hall, of Concord, state engineer, were the guests. The meeting was brought about in the interest of good roads and motor legislation. Governor Bass outlined the policy of the state and he was given an ovation. A business meeting followed and twelve new members were admitted to membership. Then followed an election of officers, resulting as follows: Halbert N. Bond, president; Elmer D. Goodwin, vice-president; Charles E. Merrill, secretary-treasurer; Hovey E. Slayton, William H. Topping, Albert W. Thompson,



IMPROVING THE SANTA FE TRAIL

The above illustration shows interest taken in good roads by Coloradoans. The scene is 5 miles from Pueblo

Four Winds

Walter T. Anthony, Arthur M. Heard, J. L. Loisele, Ralph M. Marden and John C. Marshall, directors; William Parker Straw and Charles M. Floyd, delegates to the state and national conventions.

Good News for Lucas County—At the recent election held in Toledo the voters authorized the commissioners of Lucas county, Ohio, to levy a tax of .375 mills additional for maintenance of improved roads for two years, and .25 mills for bridge improvements and repairs for one year. This comes as a decided relief, as under the Ohio law the funds had become badly depleted and it looked as if road work in the entire county might come to a standstill. With this additional fund it will be possible to continue projects already started and develop new projects contemplated. Road work in northwestern Ohio has been general this season and more progress was made than for many years.

Pittsburgh Club Prosperous—The Automobile Club of Pittsburgh is winding up the season with much the largest membership in its history. It has 460 active members in Pittsburgh, besides a large number of non-resident members from western Pennsylvania. Owing to the fact that the Allegheny county commissioners have taken up the work of building county roads with a vim the club has done less this summer in road building agitation than formerly. Its officials decided some time ago to do away with the prize to road supervisors, as they found that supervisors were devoting all their time to some prize road in the hope of getting the award offered by the club, instead of doing work on all roads, as they were paid to do. The club is making some objection to the

brick roads being built lately because they are only 15 feet wide and have a high curb, making it very difficult to meet and pass hay wagons, etc.

Pittsburgh Club Has New President—The Automobile Club of Pittsburgh has a new president in the person of H. L. Mason, Jr., who was elected recently to succeed Edward Kneeland, who resigned the office on account of pressure of other business. Mr. Mason will continue in office until the annual election of the club, February 1.

Virginians Elect—Professor W. Milner Lile, of the University of Virginia, has been elected president; R. W. Holsinger, first vice-president; W. F. Carter, Jr., of Crozet, Va., second vice-president; Dr. C. F. Wooding, secretary, and A. N. Adams, treasurer, of the Charlottesville and Albemarle County Automobile Club, which will be affiliated with the Virginia Automobile Association. The board of governors of the newly organized club is composed of the following: A. H. Lloyd, J. H. Lindsay, Hollis Rinehart, W. A. Irving, and E. E. Egan. A committee on by-laws and constitution was named.

Will Improve Bad Stretch—That the improving of the bad stretch of road between Perryville and Elkton on the way to Philadelphia will be attended to seems certain by recent results. The Cecil county commissioners have \$25,000 in bonds ready to be issued for good roads work providing the Automobile Club of Maryland can induce motorists to raise the other \$5,000 necessary to complete the stretch of road in question. In addition to this the bridge company which controls the span over the Susquehanna river has offered to donate \$2,000 for this work, while at the monthly

meeting of the club an additional \$1,000 was raised. This makes only \$2,000 more necessary for the work. There is 10 miles of this bad stretch of road and it is figured that it will cost \$3,000 per mile to do the work.

Asks About Expenditures—Whether Maryland will continue the present system of road building the next 4 years depends upon Governor-elect Goldsborough, who has intimated that he will have the books of the state roads commission audited to see where the money has been spent. Should this work continue a new loan of \$5,000,000 must be issued by the next legislature, \$1,000,000 of which would be used for improved streets in Baltimore. The democratic majority in the legislature would not sanction such a loan unless it knew how the money would be spent.

Riddle on the Map—A hamlet of 100 inhabitants, without a single motor car less than a year ago, Riddle, Douglas county, Oregon, today proudly boasts of a population of 500, and seventeen motor cars are divided among this number. The farmers in Douglas county are buying motor cars and building in town, going to and from their ranches in their machines all during the year, thus being able to personally supervise their interests and still be in a position to enjoy the conveniences of the city. There is little or no snow around Riddle and the excellent character of the roads affords ideal motoring all the year.

Peoria Wants a Show—The Peoria Automobile Club, of Peoria, Ill., which was formed last season at the conclusion of the Peoria show, has just announced that plans are under way for another show at the Coliseum in January. Because of the limited show space in the Coliseum, local dealers will be the only exhibitors. Even with this restriction it has been found that there is not space enough and the committee, which is as follows: Godfrey Luthy, chairman, E. G. Isch, and Stephen Hatfield, is negotiating for additional space in order to take care of local dealers who did not register for space in time to be cared for.

Akron Has Club Paper—The progress made by the new Akron Automobile Club, of Akron, O., was emphasized by the appearance of the Akron Motorist, a monthly publication devoted to the interests of the club and its members. No. 1, Volume I, is bright and snappy and contains a variety of matters of interest in the Akron territory. It is published under the direction of the officers of the club, who thus far are too modest to say which of them is to be designated as editor. The Akron Automobile Club was formed only a few months ago and already has 106 members out of a possible 1,000 owners in the city. The officers are: Guy E. Norwood, president; J. Ben Campbell, vice-president; F. L. Lamson, treasurer; G. Ben Motz, secretary.



CONVICTS' CAMP IN COLORADO

Convicts work on the roads in Pueblo county. Each convict is his own boss and not one has escaped in 2 years

Standard Electric Vehicles

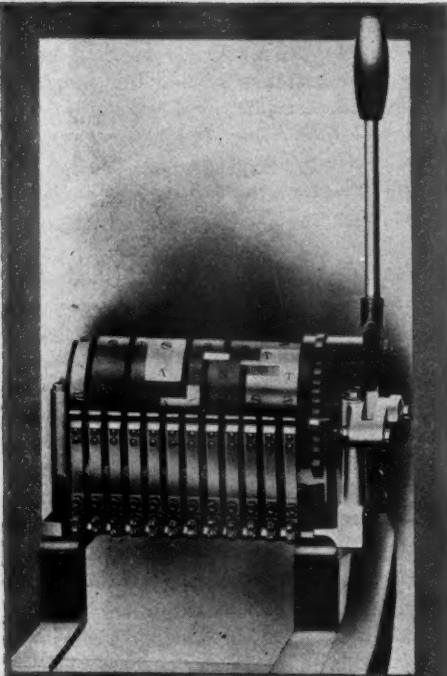


FIG. 1—STANDARD CONTINUOUS-TORQUE SPEED CONTROLLER

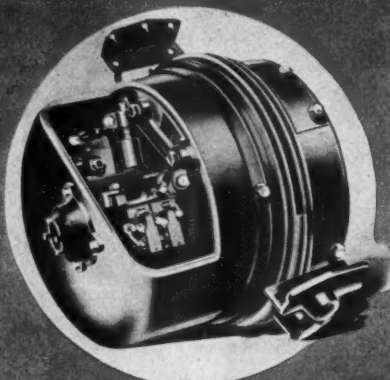


FIG. 2—ACCESSIBILITY OF MOTOR, ENCASED IN OIL-TIGHT COMPARTMENT

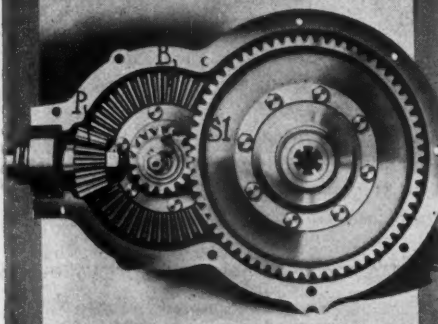


FIG. 3—DOUBLE GEAR REDUCTION IN REAR AXLE OF THE STANDARD ELECTRIC CHASSIS

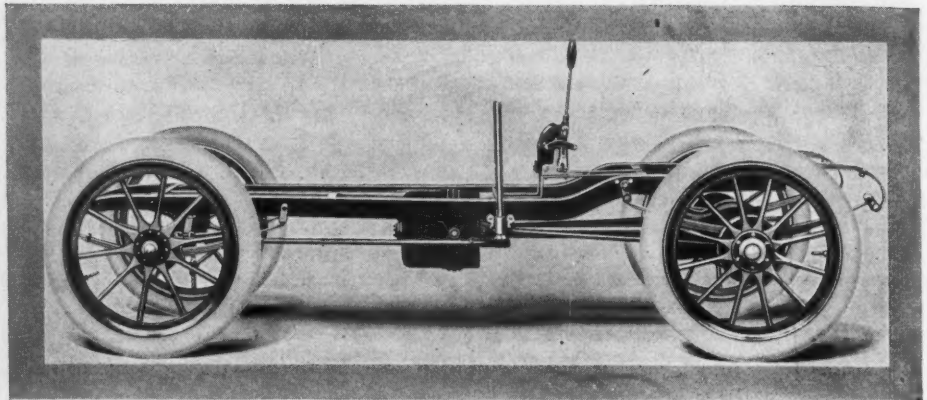


FIG. 4—SIDE VIEW OF STANDARD ELECTRIC CHASSIS

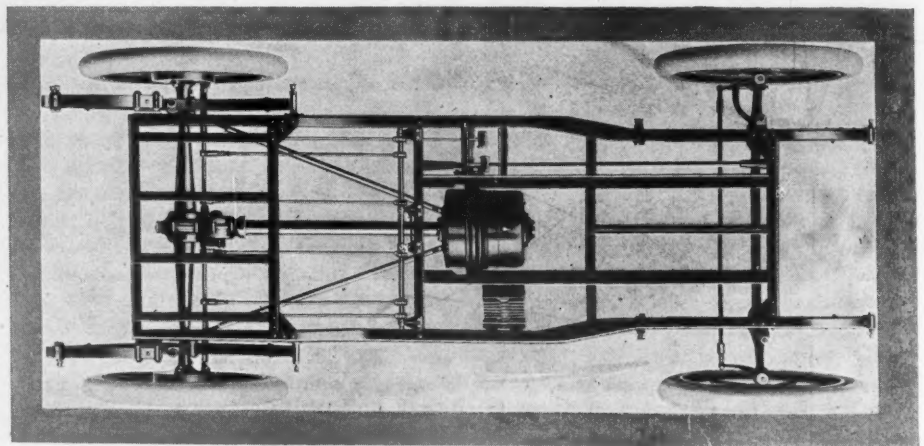


FIG. 5—PLAN VIEW OF STANDARD, SHOWING DRIVE

THE Standard Electric Car Co., Jackson, Mich., has entered the electric vehicle field with a pleasure car, illustrated on the following page, which vehicle it will manufacture for the coming season. The vehicle is a carefully worked-out product with a low-hung roomy body and a good mileage capacity. The chassis carries thirty cells of eleven-plate Exide battery located in four trays, two trays of nine cells each carried on the front end of the frame under a forward hood, and two trays of six cells each carried in the rear, these rear trays being separated to allow of the differential housing coming up between them. Each of the four trays is covered by a hood, which when raised, each cell is accessible from the outside of the car. It is not necessary to open the car doors to give the batteries attention.

The chassis is a shaft-driven type in which the high-speed electric motor, the torsion tube and the rear axle form a unit. Fig. 7 illustrates this. The motor is enclosed in a dust- and water-proof casing, with accessibility to the interior parts afforded as shown in Fig. 2. The motor is mounted in a bracket B, which is carried on two swivel brackets B1, which in turn bolt to the subframe members, and so the motor is free to conform to any movement of the rear axle and the torsion

tube. The torsion tube ties it to the rear axle, but it is also anchored thereto by two diagonal strut rods, as the plan illustration of the chassis shows. Because of the motor support, the driving effort of the rear wheels is transmitted through the torsion tube direct to the frame members. The entire motor weight is carried on the framework of the car rather than on the rear axle.

The rear axle is what is termed a three-quarter floating type. The axle housing is made up of swedged steel tubes, which unite with the differential housing and at their outer ends extend through the brake drums and the wheel hubs. A large ball bearing, directly in line with the wheel spokes, carries the entire load at each end. One end of the axle driveshaft bolts to the wheel hub and the inner end floats in the differential. As Fig. 3 shows, a double reduction is used in this axle. The bevel pinion P is on the end of the propellershaft and meshes with the large bevel gear B. This bevel B carries a small spur pinion S rigid with it, and this pinion in turn meshes with the large gear SI, which carries the differential unit. This gives a double speed reduction between the motor and the rear wheels.

The framework is an up-to-date pressed steel design, with the side members

dropped in front of the rear axle and offset at the dash as in the present-day gasoline chassis. A sturdy subframe system is also used in order to support the motor mounted midway of the axles and as near the center of the chassis as possible. Heavy gusset plates are used and joints are hot riveted. Front springs are semi-elliptics, rear ones are three-quarter elliptics, with scroll ends. Steering is by tiller mechanisms, with front steering arm above the axle, where it is out of the way of any danger. Both ends of the fore-and-aft drag link are furnished with ball-and-socket joints, cushioned on both sides to take up vibration. There are two sets of brakes, both internal expanding types, working side by side within pressed steel drums attached to the hubs of the rear wheels. Both sets are controlled by means of a pedal.

A ratchet is provided so that either one or both sets can be applied at the option of the driver. In normal operation either one or both brakes can be used as service brakes without using the ratchet. The car is a ball-bearing product from front to rear.

The lighting system consists of two side lights, one tail light, and two corner lights inside the car. All of these lamps are operated from a flange switch in the panel at the left of the operator. All of the lamps are supplied with the Edison base.

Wheels 32 inches are used front and rear. In lubricating all moving joints are provided with grease or oil cups. The reduction gears rotate in a bath of lubricant said to be sufficient for a season. All rockershafts, springbolts and brake pedals are fitted with grease cups.

The controller, Fig. 1, is of the continuous torque type, and gives six speeds forward and three reverse. The electrical contacts are built up on a drum which rotates behind the fingers.

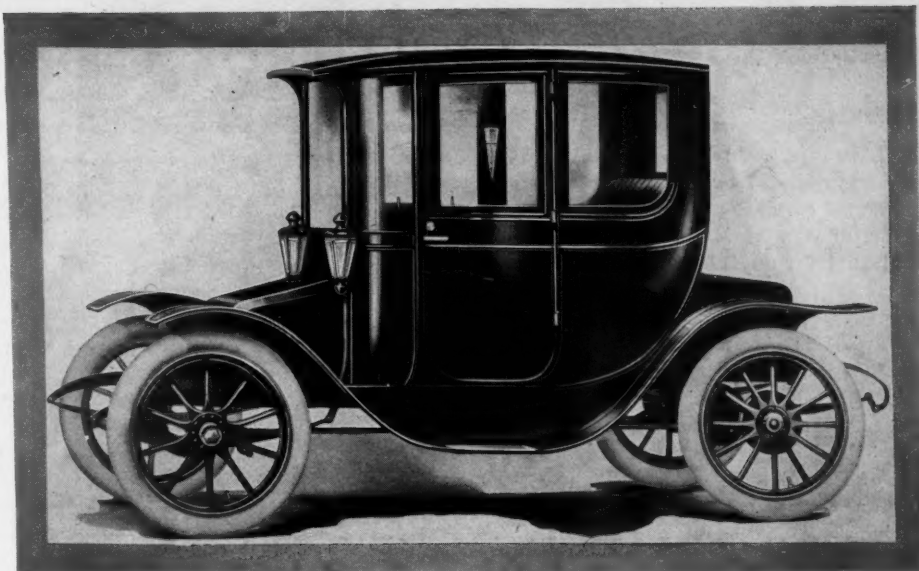


FIG. 6—STANDARD ELECTRIC WITH COUPE BODY

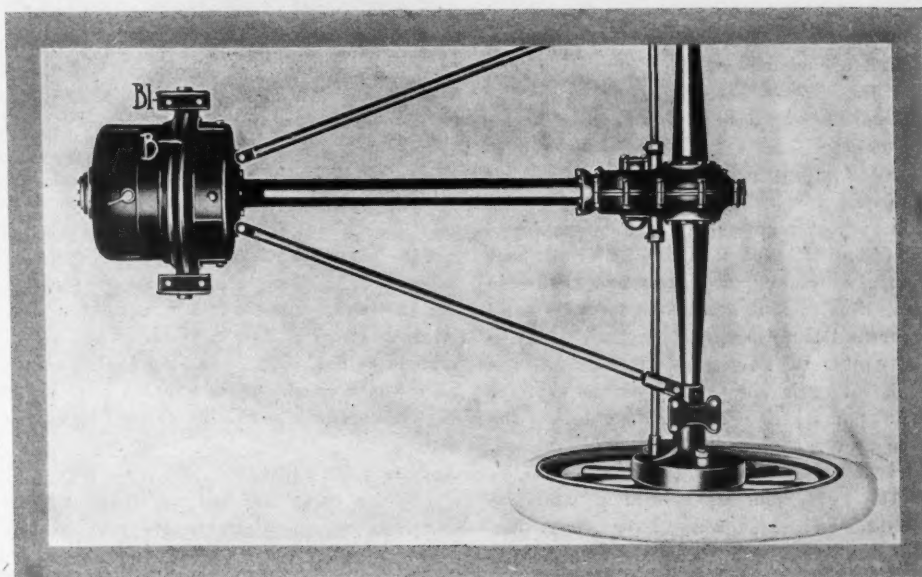


FIG. 7—MOTOR AND REAR AXLE UNIT IN STANDARD ELECTRIC

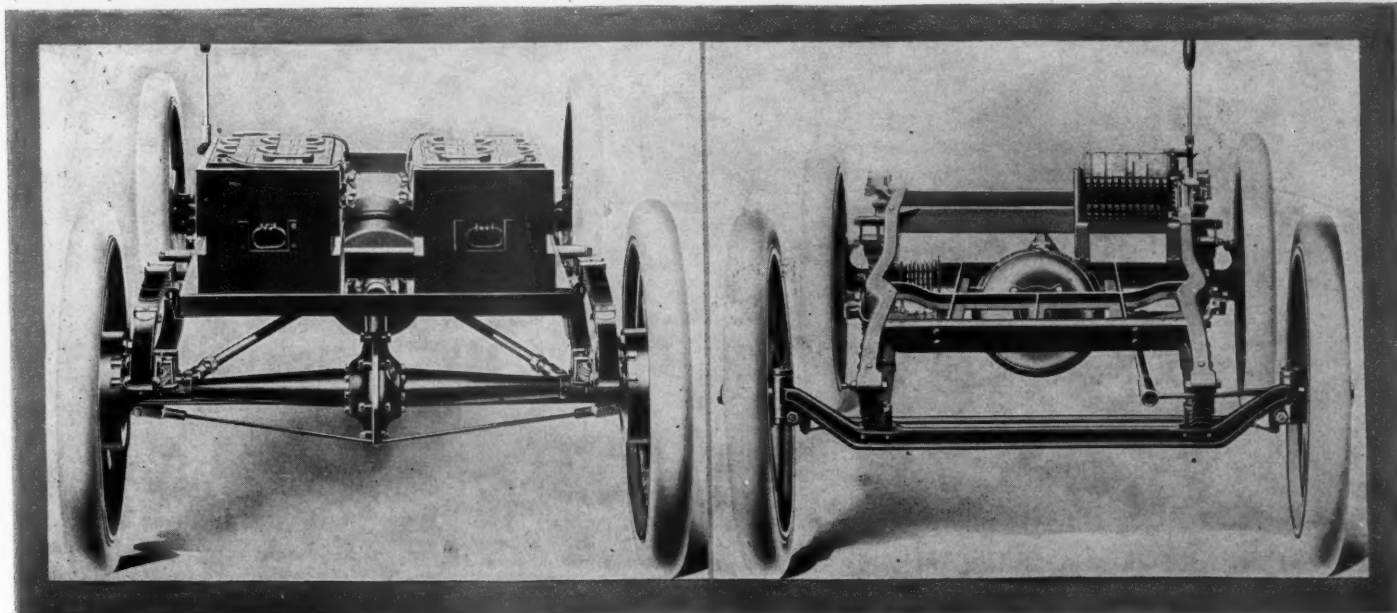


FIG. 8—PART OF BATTERY CARRIED IN REAR

FIG. 9—FRONT AXLE DESIGN OF STANDARD



The Motor Car Repair Shop

THE subject of repairshop equipment always should be an interesting one to the motor car dealer and repairer hence the editorial staff of Motor Age is ever on a still hunt for anything that is new or particularly ingenious or convenient in the way of repairs or repairshop equipment. In Fig. 1 is shown a number of features of the engine room equipment of the Peerless repairshop, Chicago. On one side of the room at the extreme left in the photograph is shown a rack upon which a number of special tools are kept. These tools are an almost indispensable part of the engine room equipment, and many are the operations facilitated by their use. As only a portion of this rack could be shown several of the tools have been removed therefrom and stood up against the motor stand which is arranged in the foreground. The motor stands themselves, three of which are shown in the illustration, also are important factors. They are of a substantial character; and being mounted on castors, not only afford a means of conveniently supporting the motors but also of transporting them about the shop. The special reamers and arbors employed in fitting the camshaft and crankshaft bearings of the motor also are shown in this illustration and considerable hand labor and time is saved by their use. In the center of the illustration but in the background is shown a portable type of rack upon which parts are kept during the time that a motor or car is disassembled. Several racks of this type are included in the equipment of this shop, and the satisfaction which they have given has

been marked. In disassembling a motor or car, one of these stands may be rolled up beside the chassis and instead of laying the nuts and bolts and other various parts upon the floor in various parts of the chassis or work bench, everything is placed on one of the three shelves of the rack. When the disassembly is complete the rack with

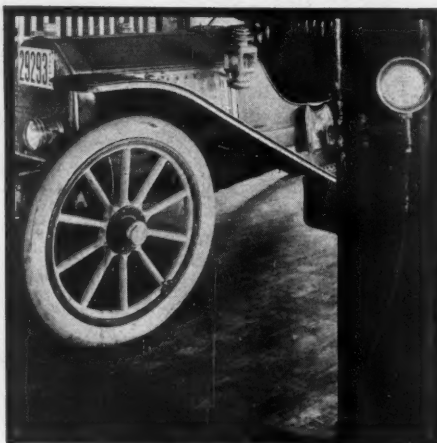


FIG. 2—A REAL TIRE GAUGE

all the paraphernalia upon it may be easily pushed into some out-of-the-way section of the shop until further need for the equipment upon it is required. Attention also is called to the band on the flywheel of the motor, which has handles upon it to facilitate turning the flywheel for valve timing, etc.

A Handy Tire Gauge

The use of compressed air in the motor car repairshop and garage is rapidly in-

creasing in popularity; and in most of the garages and repairshops in larger cities compressed air plants already are in use and the air is piped to all sections of the building where it may be conveniently used by the repairman in cleaning, and by the garage attendants for inflating tires. An excellent scheme for determining the amount of air pressure admitted into the tires of motor cars is to be found in the Peerless branch, Chicago. This consists of an air gauge which is so interposed between the source of supply and the tire of the wheel that the pressure in the tire may be readily observed and the air shut off as soon as the required pressure in the tire has been obtained. It is claimed by tire makers that 75 per cent of tire troubles is due directly to insufficient inflation. This is a startling and almost unbelievable statement but it is claimed to have been proven absolutely true by tire shop records. If a tire is run insufficiently inflated there is a kneading and bending action which is most injurious to the casing, but if the tire is kept properly inflated the converse is true. It is to enable its patrons to avoid under-inflation of tires that the Peerless company has fitted these gauges to all of the compressed air connections, used about their building for the purpose of inflating tires. It is a commendable addition to the garage equipment and worthy of adoption by every garage throughout the country supplying compressed air to their customers. Many garages provide their attendants with little pocket gauges for testing air pressures in tires, but these are often lost or mislaid.

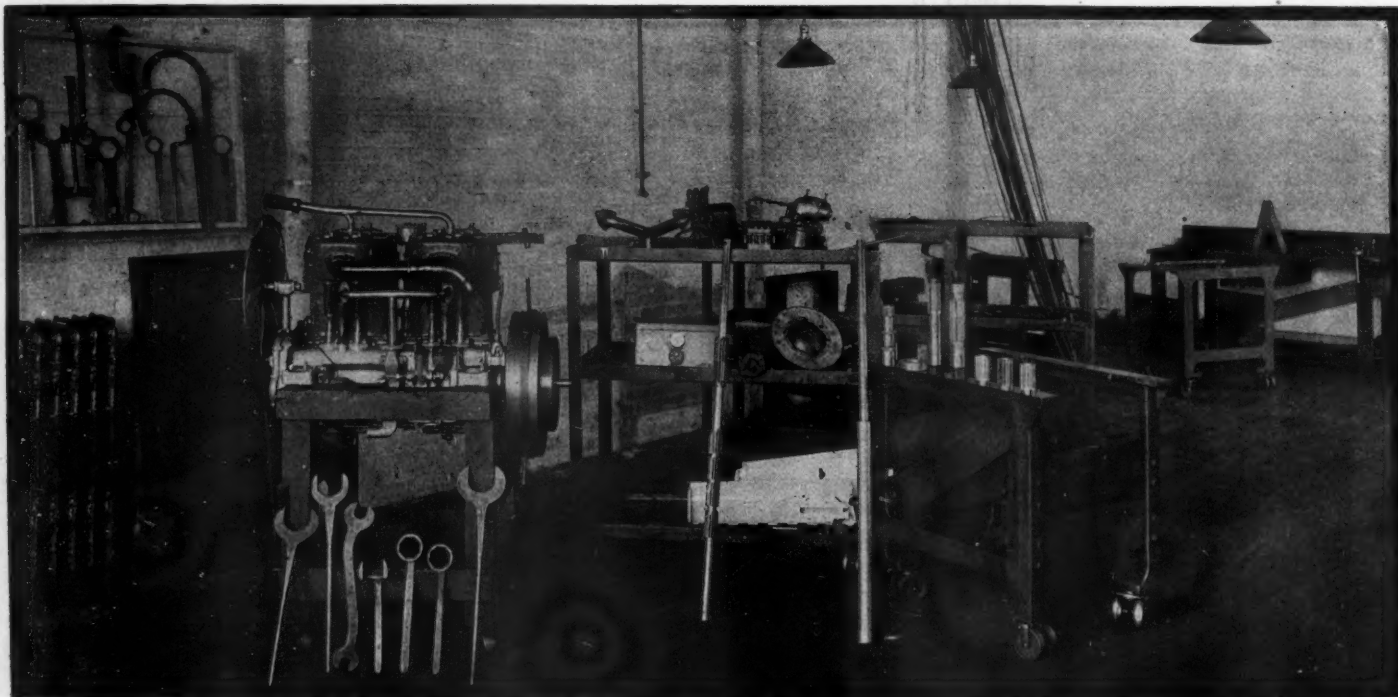
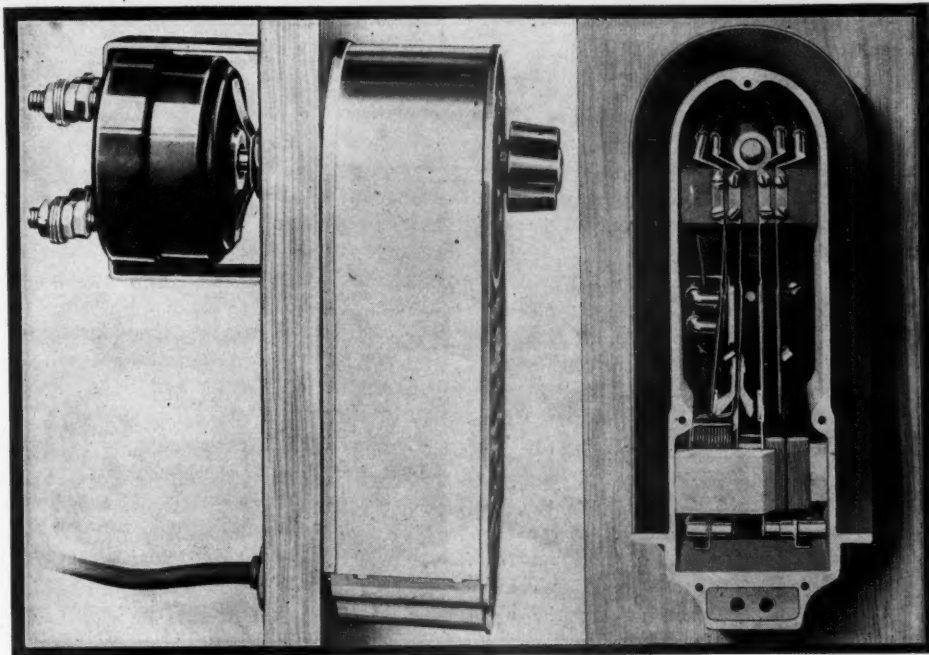


FIG. 1—SHOWING MANY OF THE SPECIAL ARTICLES OF EQUIPMENT IN AN UP-TO-DATE ENGINE REPAIR SHOP



Development Briefs



AUTOMATIC CONTROLLER OF MATCHLESS LIGHTING AND IGNITION SYSTEM

THE Matchless electric lighting and ignition system for motor cars and motor boats, manufactured by The Esterline Company, La Fayette, Ind., possesses some very unique features.

The equipment comprises a positively driven, magneto type direct current generator, a storage battery and an automatic, self-closing, low-voltage release, overload, reverse current controller. The generator is made to connect directly to the pump shaft in the same manner, as an ignition magneto, without the use of a speed governor or speed controlling device. It is supplied with complete ignition equipment, which can be omitted if desired, so that the ignition magneto can be retained or dispensed with, as the user may desire. The use of a machine without the usual speed controlling devices, it is claimed, adds greatly to the reliability of the system, and the driving of the generator at a speed at all times in direct proportion to engine speed enables the makers to combine the lighting and igniting equipment in one outfit. In this system the charging current is automatically regulated and the absence of all mechanical speed control or electrical voltage regulating devices makes the equipment extremely simple and very reliable in operation. The use of a permanent magnet generator is made possible by the unique electric controller which comprises a part of the system. The controller has four distinct functions, as follows:

1—To connect the battery to the generator when the voltage of the generator has reached the point where it will charge the battery.

2—To limit the current through the battery to the normal charging rate, when the generator is running at high speed.

3—To disconnect the battery from the generator whenever the voltage of the generator is less than that of the battery.

4—To prevent the connection of the battery to the generator when the car is driven backwards.

The controller consists essentially of a die cast metal case, over which is placed a permanent magnet, with pole pieces projecting into the case; a pair of coils surrounding the pole pieces, but capable of motion relatively to the pole pieces; a cover plate, which seals the case tightly, rendering it dust and moisture proof.

All of the moving parts of the controller are mounted on phosphor bronze leaf springs, $\frac{1}{2}$ inch wide, set rigidly in an insulating block; these springs serve the double purpose of supporting the coils and leading the current to them. The coils are the only moving parts, and these simply float in a magnetic field so that there is no friction whatever, and no bearings or pivots are required, since the moving parts are supported by the leaf springs.

The operation of the controller is such that all electrical circuits are opened and closed at the instant the current is zero; that is to say, no currents whatever are broken, there is no sparking or burning of the brush contacts. With the car at rest or running at slow speed, the connection between the battery and the generator is open, but when the voltage of the generator becomes sufficient to charge the battery, the circuit between the battery

and the generator is closed. Should the speed continue to increase, as soon as the charging current reaches the normal charging rate of the battery one of the coils comes into action and prevents the current from exceeding the normal charging rate.

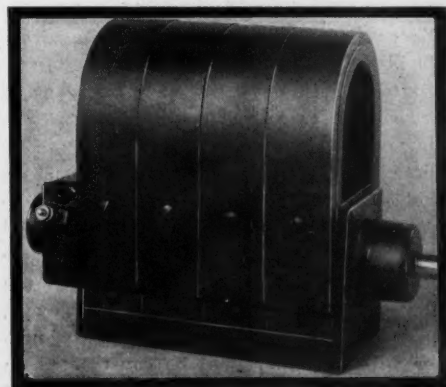
The cover plate of the controller forms the switch dial; a four point, back connected switch is used. Openings are provided in the front of the controller for plug connections to an exploring lamp.

The generators are made in two sizes; the smaller size has a capacity of $7\frac{1}{2}$ amperes continuously at 6 volts, and is intended for use on smaller cars and boats. The larger machine has a continuous capacity of $12\frac{1}{2}$ amperes at 6 volts and is designed for large cars, commercial vehicles and large boats.

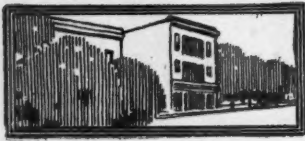
New Truck Tire on Market

The United States Tire Co. has placed on the market a new tire branded United States tire which is demountable. It has been built to meet the requirements of specifications recently adopted by the Society of Automobile Engineers. The one feature of the tire is that through its use both single and dual tires can be changed without removing the wheel from the truck. Replacements can be made by any ordinary workman in less than one-half the time required with styles of fastening that have heretofore prevailed.

These demountable features are possible through making the inside diameter of the tire band $\frac{3}{8}$ inch greater than the outside diameter of the wheel. This additional size gives a clearance between the tire band and the wheel band of 3-16 inch. Into this open space wedges are forced, which are part of the flanges. In making replacements it is only necessary to take off the flange wedges and remove the tire. The tire itself is built on a steel band with a layer of hard rubber between the band and the soft rubber tread. The band has a serrated periphery so as to form a dove-tailed seat.



DYNAMO OF MATCHLESS SYSTEM



Among the Makers and Dealers



EMPIRE Going to Detroit—Carl G. Fisher is authority for the statement that the Empire Motor Car Co., of Indianapolis, will remove to Detroit. No details are vouchsafed at present.

Rousseau with Imperial—A. J. Rousseau, who has been identified with the General Motors Co. for some time past, has been appointed sales manager in charge of the western district for the Imperial Automobile Co., of Jackson.

More Ford Branches—The Ford Motor Co. has recently opened branches in Louisville, Ky., and Hamburg, Germany. The company's factory addition is rapidly nearing completion. The increased facilities are greatly needed, as the business, particularly the export trade, continues to expand.

Republic Branch in Detroit—The Republic Rubber Co. of Michigan has been incorporated and will handle the full line of motor car and motor truck tires manufactured by the Republic Rubber Co., of Youngstown, O. The Detroit salesroom and offices will be located at 1001 Woodward avenue, with C. P. Foley in charge.

Big Fire at Ottawa—Fifty thousand dollars' worth of cars were burned at Ottawa, Canada, November 17, when the garage of Pink & McVeity, on Sparks street, caught fire by the explosion of a gasoline torch held by a mechanic on the premises. Fifty cars were stored on the premises, but half of them were saved. Three hundred gallons of gasoline were stored in tanks below, but they proved the worth of a fireproof construction. The value of the building burned was \$15,000.

Studebakers Qualify in Indiana—The Studebaker Corporation of America, a part of the \$45,000,000 corporation formed by the South Bend manufacturing concern and incorporated in New Jersey, has been certified to do business in Indiana, with a capital stock of \$10,000. The company is capitalized in New Jersey for \$100,000. Its purpose is to manufacture and sell motor cars.

Baby Amplex Planned—The Simplex Motor Car Co., of Mishawaka, Ind., has decided to manufacture a moderate-priced car in order to meet the demand for such a car. The engineering force is now at work on plans which when completed will be turned over to the mechanical department. The new car is to be known as the new 40 baby Amplex and will be equipped with a five-passenger body. The engine to be installed in the new car will be four-cylinder, two-cycle, valveless type. While the same type motor will be used it will be constructed on smaller lines to conform with the size of the car. The capacity of the plant will

be increased from the present output of 300 cars to 1,300 cars per annum. Of the 1,300 cars turned out 1,000 will be of the Baby Amplex model.

Krit's Foreign Shipments—The Krit Motor Car Co. has just shipped fifty cars to Great Britain and twenty-three to other foreign countries. The company is devoting more attention to its export trade than formerly.

Moving into New Building—The K-W Ignition Co., Cleveland, O., is at present preparing to move into its new fireproof building. This is a steel construction reinforced with concrete. It is 165 feet long, 75 feet wide and four stories high. The building is fireproof from top to bottom.

Receiver for Star Company—George Lehnert has been appointed receiver for the Star Motor Car Co., of Indianapolis, by Judge Collier, of the superior court of Indianapolis. Action asking the appointment of a receiver was brought by Theodore M. Weiss, a stockholder, who alleges the concern is insolvent. The company was organized and incorporated in November, 1909, for the purpose of manufacturing motor cars, but has never built but one car. Offices have been maintained in the Lemeke building.

After Uniform Garage Rates—Efforts are being made by garage keepers in Wisconsin to arrive at a uniform scale of rates for live storage, washing and polishing. The accepted schedule is as follows: Two to five-passenger cars: Storage, 50 cents a day; per month, \$15; washing, \$1; polishing, 50 cents. Seven-passenger cars: Storage per day, 75 cents; per month, \$20; washing, \$1.50; polishing, 50 cents. Limousines: Storage per day, 75 cents; per month, \$20; washing, \$2; polishing, 50 cents; use of wash rack, \$1. Electric pleasure cars: Per day, \$1.50; per month, including washing, polishing and charging, \$32.50. A uniform scale of prices for gasoline and oils is also to be made.

Electric Show for Boston—There is to be an electric vehicle show in Boston next year, plans for which are now being developed by the officers of the Boston Electric Club. This show will take place in Mechanic's building and last about a month from September 28 to October 26, 1912. About 15,000 square feet of floor space has been set aside, and nearly two-thirds of this space has already been engaged by the dealers. All the most up-to-date vehicles will be exhibited, both pleasure and commercial, and all the latest appliances for motor cars will be shown, too. This will be the biggest exhibition of electric vehicles exclusively ever held anywhere, it is claimed. In addition to the

exhibition there is to be an electric vehicle garage presented. Men prominent in the electric vehicle field will make addresses at the exhibition on the utility and cost of electric machines.

Walton a Timken Official—Edwin A. Walton, former assistant advertising manager of the Burroughs Adding Machine Co., has been appointed to the newly created position of advertising manager of both the Timken Roller Bearing Co., of Canton, O., and the Timken Detroit Axle Co., of Detroit, Mich. Headquarters of the new advertising department will be at the office of the Timken Detroit Axle Co., in Detroit.

Hoosiers Plan Another Jaunt—Will H. Brown, president of the Mais Motor Truck Co., has been made chairman of a committee of the Indianapolis Trade Association to arrange a trade extension trip through southern states, which will be given in February. A special train carrying not only Indianapolis, but Indiana manufacturers, jobbers and wholesalers as well, will visit Louisville, Nashville, Atlanta, Macon, Birmingham, Jacksonville, Albany, Savannah, Montgomery, Mobile, Meridian, Jackson and Memphis. There is some talk of extending the trip to Havana, Cuba, but this is to be decided later.

Remy Absorbs Peters—The Remy Electric Co., of Anderson, Ind., which recently absorbed the American Electric Headlight Co. and now makes the American electric headlight for steam locomotives, has purchased outright all patents, designs, goodwill and manufacturing rights of the Peters electric headlight for steam locomotives. The locomotive headlight departments of the R. G. Peters Co., of Grand Rapids, Mich., have been moved to Anderson and the Peters light will be owned, manufactured and sold by the Remy company. New buildings will be erected at the Anderson plant to care for the increased production of the Peters lighting apparatus.

New Columbus Enterprise—The Union Sales Co., of Columbus, Ohio, is backing the organization of what will be styled the Union Motor Car Co., which will manufacture a new line of motor cars to be known as the Union 25. The work of manufacturing has been started at the plant of the Dunlap Engineering Co., 1436 Parsons avenue, and it is announced that the first car will be turned out within 2 weeks. J. W. O'Brien, of Nashville, Tenn., is at the head of the Union Sales Co. and will also head the manufacturing company. It is proposed to capitalize at \$500,000, a part of which will be paid in at the beginning. Mr. O'Brien formerly was connected with the Southern Auto-

mobile Co. of Nashville, the Southern Automobile Co. of Birmingham, and the Primo Motor Car Co. of Atlanta. Only one model will be made and that will be a two-seated low-priced runabout.

Want an Investigation—Asserting that Frank Neville, of Bellefontaine, O., doing business as the Standard Automobile Co., had filed in the probate court of Logan county, Ohio, a petition of assignment and had previously given mortgages to prefer two creditors, the King Top Mfg. Co., of Dayton, and the K. L. Essly Machinery Co., of Chicago, and the Hamilton Brothers Co., of Bellefontaine, have filed a petition in the United States court at Columbus, under the bankruptcy act, asking that an investigation be made and a fair distribution of the assets.

Fasquelle General Sales Manager—Through the merging of the sales organizations of the Rapid and Reliance divisions of the General Motors Truck Co. into one general sales organization, L. J. Fasquelle has succeeded to the position of general sales manager of the General Motors Truck Co. Under Mr. Fasquelle's direction, branch houses are being established in the large commercial centers, and agency and dealer connections will be rapidly extended to cover all territories. T. P. Myers, formerly sales manager of the Rapid division, has assumed charge of the service department of the General Motors Truck Co.

New Self-Starters—A company known as the Motor Starting Co., to manufacture a self-starting device, has been organized in Indianapolis. Quarters have been taken at 427 North Meridian street and factory arrangements are to be made immediately. The device consists of a hand air pump and small carbureter located on the floor near the driver's seat, with a tube running to each cylinder head. A mixture consisting of one drop of gasoline to sixty-five parts air is pumped into the cylinders and a spark causes sufficient combustion to start the motor. Lew W. Cooper, formerly a member of the city council and later president of the board of public safety, has been elected president of the concern.

Fight over Detroit Plant—Honors are about even between the Herreshoff Motor Car Co. and the citizens of Detroit, who have been fighting the company in the courts, in an effort to prevent the establishment of a motor car plant in a fashionable section of Woodward avenue. In the recorder's court, last Thursday, Judge Connolly denied a motion made by the company's attorneys to quash the condemnation proceedings instituted by the citizens interested. In the Wayne circuit court, the following day, Judge Donovan refused to issue an injunction restraining the building operations, which at no time have been suspended since they were begun several months ago. The factory is now well along and the probabilities are

that operations will have started by the time the condemnation proceedings are heard. It is almost certain that the case will go to the supreme court for final adjustment.

Moving to Bowling Green—The Universal Machine Co. is removing from Toledo to Bowling Green, O. The new factory has a floor space of 22,000 feet and will manufacture the Toledo marine engine. By the first of the year the company expects to manufacture parts for the Modern Motor Car Co.

Radiator Plant for Laporte—The establishment of a factory in Laporte, Ind., to manufacture radiators for plowing engines and possibly motor cars, is practically a certainty and it is expected to erect a factory building this fall. E. H. Scott and Dr. Edward A. Rumely are largely interested in the new proposition.

Chevrolet Company Elects Officers—The recently organized Chevrolet Motor Car Co., which has started clearing ground out Woodward avenue, Detroit, for a big plant, has elected officers as follows: President, William H. Little, of Flint, formerly general manager of the Buick plant; vice-president and treasurer, Dr. E. R. Campbell; secretary, Curtis R. Hathaway; designer and consulting engineer, Louis Chevrolet; assistant secretary and treasurer, W. W. Murphy. The company will manufacture the Chevrolet six.

Walter Forms New Company—W. Walter, who has been manufacturing commercial cars at 49-51 West Sixty-sixth street, New York, has incorporated a new concern under the name of Walter Motor Truck Co., to take over the business. The new company will manufacture on a larger scale, getting out the same models as heretofore built, namely, 1½, 2, 3, 3½ and 5-ton trucks. A factory and garage will be put up in the neighborhood of Broome street, Greenwich village, New York city. Mr. Walter is president of the new company and will give his attention to the manufacturing of trucks. Mr. Fletcher, who is coming into the company, will be vice-president and treasurer and will look after the selling end of the business.

Change in Louisville—The Kentucky Wagon Mfg. Co. of Louisville has succeeded to the business of the Electric Vehicle Co. by the purchase of the designs, drawings, patterns and equipment of the latter company, and will build all sizes of commercial vehicles of the electric type, ranging in capacity from a 1,000-pound delivery wagon to a 3½-ton truck. The Kentucky company, which was established in 1879, occupies a plant which covers 17 acres, and the location includes 30 acres. In 1890 the concern took over the Cherry, Morris & Co. plant of Nashville, maker of the Tennessee wagon. It has manufactured that wagon in connection with the Old Hickory. The combined sales of the company, it is said, have been in excess of 1,000,000 wagons. H. Hewitt, who was

in charge of the Electric Vehicle Co. previous to the time it was taken over, has been made general manager of this department.

To Make Overlands in Indianapolis—While in Indianapolis recently John N. Willys, president of the Willys-Overland Co., announced the company would resume manufacturing Overland cars in Indianapolis immediately. At least 2,500 touring cars are to be made in Indianapolis during the 1912 season. On June 1 it was decided to manufacture all Overland cars in Toledo, but it has since been found advisable to turn out a part of the output in Indianapolis.

Will Make Littand Bronze—The Littand Mfg. Co., of Kenosha, Wis., has been organized here to engage in the manufacture of a new metal, a bronze alloy known as Littand bronze. The metal is claimed to be six times as strong as bronze or brass and can be worked in the heated state, as steel. A. Littand is president; Charles Anderson, vice-president; William Anderson, secretary, and George Fisher, Jr., treasurer.

B. P. Remy Going Abroad—B. Perry Remy and Mrs. Remy will sail from New York December 2 for Mediterranean points and expect to spend most of the winter in Egypt, a trip up the Nile being included in their itinerary. Contrary to various rumors from time to time, Mr. Remy will not be actively in business again before next spring. Both B. P. and Frank Remy still are stockholders in the Remy Electric Co., but neither is active in its management.

Death of Edgar W. Mix—Officers of the General Motors Co. were shocked by the news that Edgar W. Mix, the company's Paris manager, had jumped from a steamer while on his way from England to the continent a week ago. A week ago Saturday the company received an intimation that all was not well with Mr. Mix in the form of a cablegram from London, stating that he had suffered a mental breakdown. It is believed in Detroit that his trouble was brought on by overwork. He was of an extremely nervous temperament. It is stated that he had no financial responsibilities with the company.

More Fisk Branches—The Fisk Rubber Co., of Chicopee Falls, Mass., will soon open direct factory branches in Brooklyn, N. Y., Pittsburgh, Pa., Cincinnati, Ohio, and Butte, Mont., increasing the total number of direct factory branches to thirty-four, the entire list being as follows: New York, Boston, Providence, Springfield, Mass., Hartford, Philadelphia, Baltimore, Atlanta, New Orleans, Syracuse, Rochester, Buffalo, Brooklyn, Cleveland, Detroit, Milwaukee, Chicago, Indianapolis, St. Louis, Minneapolis, St. Paul, Fargo, N. D., Kansas City, Mo., Omaha, Denver, Seattle, San Francisco, Oakland, Sacramento, Fresno, Cal., Los Angeles, Pittsburgh, Cincinnati, Butte.

TIFFIN, O.—C. G. Meyer & Son have contracted as dealers in Franklin cars.

Syracuse, N. Y.—The Metz is now handled by H. C. Brower & Son at 317 East Genesee street.

Moscow, Idaho—The Moscow Automobile Co., with Harry K. Moore at its head, will handle the Cole.

Portland, Ore.—The Rose City garage, of Portland, has taken over the Oregon distribution of the Baker electric machines.

Milwaukee, Wis.—The Goodyear Rubber and Tire Co. has established a branch at 134-136 Oneida street. H. P. Ziegler is manager.

Boston, Mass.—The Hollander Motor Car Co., agent for the Metz cars in New England, has moved into its new building on Boylston street near Massachusetts avenue.

Boston, Mass.—The Boston branch of the Franklin has been moved from Boylston street over to Irvington street, where the company has its service station.

Syracuse, N. Y.—The Hupmobile agency for this city and central New York is now located at the Bissell garage in South State street, under the management of T. P. Anderson.

Indianapolis, Ind.—The Merchants Auto Co., recently organized in Indianapolis, and which has located in North Delaware street, has taken the Indiana agency for the Woods electric.

Sandusky, O.—The capital stock of the Sandusky Auto Parts and Motor Truck Co. has been increased from \$15,000 to \$500,000. A. F. Knotts is president and R. D. Mitchell, secretary of the corporation.

Des Moines, Ia.—The Colby Motor Car Co. will open a branch in Des Moines. Quarters have been secured at 1017 Walnut street. W. H. Shadbourn, sales manager for the Colby, will be in charge of the local branch.

Louisville, Ky.—Articles of incorporation for the Transit Motor Car Co., with a capital stock fixed at \$20,000, have been filed here by E. C. Walker, George H. Laib and W. B. Young. The concern will manufacture the Transit truck.

Bridgeport, Conn.—Despite protests made by numerous churchgoers in this vicinity, Campyon B. Cutter has purchased the Long Hill Methodist church and transformed it into a garage. He will handle the Everitt cars for this territory exclusively.

Los Angeles, Cal.—The Gorham Engineering and Fire Apparatus Co. has leased a one-story brick building on Olive street; the California Automobile Co. has leased a one-story new brick block; the Motor Service Co. has leased a one-story brick building on Spring street; the Olds Motor Co. will lease the building between Twelfth and Pice streets on Olive, while T. W. Brotherton, agent for Haynes and

Brief Business

Krit, will occupy space with the Gorham Rubber Co.

New York—The New York branch of the Oakland Car Co. has moved into new quarters at 1600 Broadway.

Jacksonville, Fla.—W. A. Worley has again secured the contract as dealer for the Franklin Automobile Co.

Syracuse, N. Y.—The Lane Automobile Association agency for the Klinekar has now taken a new garage at 210 East Onondaga street.

Milwaukee, Wis.—Herman Penner has resigned as manager of the Petrel Motor Car Co. and joined the staff of the Edgar F. Sanger Co.

Syracuse, N. Y.—The Chase Motor Truck Co. of this city is rushing work on its new three-story addition in Wyoming street and expects it to be completed by the middle of next month.

Grand Forks, N. D.—The Ford Automobile Co. is the newest motor concern to be established in this city. The company is to handle the Ford in this vicinity. Tom Moore is the manager.

New York—George Armstrong, representing Carlos Armstrong, E. Hijos, Playa-Ponce, Porto Rico, on a recent trip to New York, arranged with the Colt-Stratton Co., Cole eastern distributor, to handle the Cole in Porto Rico.

Utica, N. Y.—The Oneida Garage Co., 215 Park avenue is to erect a new garage. It is planned to have the building of concrete construction with 50 feet frontage on Park avenue, and will be 115 feet deep, and will be two stories in height.

Wyoming, Ill.—E. H. Brown, Stark county agent of the E-M-F and Flanders cars, is planning an extension to his garage and a number of other improvements this winter. Mr. Brown has again contracted for the Studebaker lines for the coming season.

Lynn, Mass.—The two-story building at 28 Central avenue, occupied by Charles Whitten as a garage for Chalmers and Thomas cars, for which he has the agency in Lynn and vicinity, was badly gutted by fire last week with a loss estimated at about \$10,000.

Freeport, Ill.—A. H. Kloepping & Co. is a new firm here which will take over the Bijou garage and handle the Studebaker lines in Stephenson county for 1912. While the main office of the company will be located here branches will be established in Orangeville under the management of A. M. Snyder, Rock City under the management of A. H. Kloepping, while the Freeport end will be handled by George Mitchell. Branches will also be established at German Valley and at Pearl City, which will give the new company

representation in every section of the county.

Pittsburgh, Pa.—The Fruit-Ohl Co., of Sharon, Pa., has been signed up as a Franklin dealer in this district.

Denver, Colo.—The Auto Equipment Co. has taken the rooms formerly occupied by the Cadillac agency at 1536 Broadway.

Denver, Colo.—C. F. Cole, who was the Cole agent at Canton, O., has gone to Denver and will become the Cole distributor in Colorado.

Dayton, O.—The Ohio Mercer Sales Co., with headquarters in Dayton, has taken over the agency for the Mercer car for the state of Ohio.

Penacook, N. H.—H. W. Alexander, Cole agent, has taken on a partner, H. A. Gardner. Under the firm name of the Concord Auto Sales Co., the two will handle the Cole line from this city.

Kansas City, Mo.—Ground has been broken for a new garage and sales room for the Hart Motor Car Co., local distributor for the Inter-State cars, at Seventeenth and McGee streets.

Des Moines, Ia.—The branch of the Interstate Auto and Supply Co., of Sioux City, opened here this week. George Jamieson is manager here, and H. B. Groves, proprietor, will take charge of the Sioux City business.

Cincinnati, O.—The Guarantee Auto Co., distributor of the Regal and Dorris cars, has given notice of the discontinuance of business. H. C. Wendel, former general sales manager of the company, will probably act as agent for the Dorris car.

Galesburg, Ill.—Callender & Petrie is the style of a new firm which will handle the Rambler line of cars in this vicinity, with headquarters in Galesburg. A new garage and salesroom is being fitted up on Prairie street which will be ready for occupancy in a short time.

Syracuse, N. Y.—A. M. Welch, for about 8 years with the Studebaker company, and for the past year manager of the commercial car department of the Franklin works at Syracuse, has now taken up territorial work with the Stevens-Duryea company, of Chicopee Falls.

Philadelphia, Pa.—The cluster of car concerns that some time ago withdrew from North Broad street and migrated to the neighborhood of Market and Twenty-first streets, where a second gasoline row is in process of formation, is further augmented by the announcement that the Marmon agency will resign its old quarters at 1532 Sansom street and henceforth be located at 3 and 5 North Twenty-first street. The new home of the Automobile Co. of Philadelphia, distributor of the Marmon, adjoins that of the Foss-Hughes

Announcements

Motor Car Co., which handles the Pierce-Arrow.

Portland, Ore.—Dulmage & Smith have closed negotiations for the agency of the Mitchell in Oregon territory.

Montreal—Scott & Pease have opened a show room at 632 St. Catherine street West, where it will sell the Pope-Hartford and Baker electrics.

Portland, Ore.—The Twitchell Motor Car Co., agent for the Cole, has moved from Union and Wasco streets to Fifteenth and Washington streets.

Akron, O.—E. D. Whorley, formerly branch manager of the B. F. Goodrich Co.'s Dallas, Tex., branch, has now accepted a position with the Motz Tire and Rubber Co., of Akron, Ohio.

St. Louis, Mo.—R. H. Combs, formerly in charge of the St. Louis branch of the Prest-O-Lite Co., has been appointed to the position of general traffic manager of that concern, with headquarters at the Indianapolis factory.

Chicago—E. A. Bessom, formerly on the engineering force of the Stevens-Duryea and Thomas companies, and more recently of the American-La France Fire Engine Co., has joined the engineering force of the Stromberg Motor Devices Co.

San Francisco, Cal.—The Stanley Steam Car Co. has been organized to handle the car of that name. The company is composed of L. H. Austin and C. E. Bennett, of Bakersfield. Temporary quarters have been secured at 607 Valencia street.

Bridgeport, Conn.—A deal has been closed by which Fred L. Mills becomes sole owner of the Elm Auto Co., of this city. The purchase was made from Thomas Morrissey, who erected a large garage a year ago. Mr. Mills will handle National, Mitchell and E-M-F.

Omaha, Neb.—The Mitchell Motor Co. has opened its new quarters at 2050 Farnam street. A large warehouse will be used in connection with the new quarters for the large stock of Mitchell cars needed to supply the agencies through Nebraska, Iowa, Kansas and South Dakota.

Washington, D. C.—T. Lamar Jackson, who handles the Stevens-Duryea, has leased the new building at 1218 Connecticut avenue, N. W., and will take possession December 1. An accessory department with Elkins Reed in charge, will be a part of the new establishment.

Milwaukee, Wis.—The Auto Parts Mfg. Co., Stroh building, has increased its operative force by forty men within 6 weeks. J. D. Millar, for many years assistant superintendent of the Reliance works of the Allis-Chalmers company in Milwaukee, has been secretary and treasurer of the company

and will in the future be in charge of the general activities of the concern.

Denver, Colo.—The Ajax Tire Co. has taken new quarters at 1518 Broadway.

Columbus, O.—D. W. Short, 14 East Swan street, has taken the central Ohio agency for the Metz for 1912.

Indianapolis, Ind.—The Kewanee garage, Kewanee, Ill., is a new Cole agent. B. Bruce Carson has taken on the Cole line for Hagerstown, Md.

Columbus, O.—J. B. Hoover, at 621 North Fourth street, has taken the 1912 agency for the Nyberg. The territory covered is all of central Ohio.

Boston, Mass.—The New England branch of the Velie has arranged to move about January 1 from his present quarters on Massachusetts avenue to a building on Boylston street now being remodeled.

Washington, D. C.—The Pope Automobile Co., agent for the Pope-Hartford, Columbus electric and Marathon, is making extensive improvements in its salesrooms at 817-19 Fourteenth street, N. W.

Kiel, Wis.—The Motor Car Co. is the style of a new corporation organized by business men at Kiel. The authorized capital is \$10,000 and the promoters are Frederick Thiessen, Philip Jugenheimer and William A. Duecker. The company will do a general agency and garage business.

Columbus, O.—The Dunlap Mfg. Co. has been incorporated with a capital stock of \$50,000 to manufacture pneumatic tools and motor car parts. The company takes over the plant of the Dunlap Engineering Co., located on Parsons avenue, Columbus. The incorporators are S. M. Dunlap, T. C. Dunlap, L. F. Sater, B. G. Watson and A. I. Schetenstein.

Los Angeles, Cal.—Don Lee, the Cadillac agent for California, has decided upon the most extensive plans for next year. Three new garages and salesrooms will be built and in addition to the new places to be used by Don Lee's branches a number of the leading sub-agencies have announced plans for exclusive Cadillac garages. New buildings are to be erected in Los Angeles, San Francisco and Oakland.

Galesburg, Ill.—Hobbie & Martin have dissolved partnership. The Buick line will be carried by W. C. Hobbie and will have practically the same territory, while W. P. Martin will retain the garage which is located on Seminary avenue, as owner and manager. Hobbie will take up a new location in the business district in Galesburg and will open up a salesroom with a small garage in connection. George Sperry, who has been with Mr. Hobbie for the past 2 years, will become a partner with Mr. Hobbie and will take up the

sales of Buick cars in Knox, Henry, Warren and Mercer counties.

Plainfield, N. J.—The Woodhouse-Lough Engine and Machine Co. is to handle Franklin cars in this locality this season, succeeding the F. L. C. Martin Co.

Toledo, O.—The Ford Brothers Co., of Toledo, has secured the building at the corner of Madison and Erie streets, recently vacated by the Buick Motor Co.

Waterloo, Ia.—The Dart Mfg. Co. has established agencies with the Frank O. Renstrom Co., of San Francisco, and the Lord Motor Car Co., of Los Angeles.

Chicago—M. Gehricke has been appointed manager of the Los Angeles branch of the Stromberg Motor Devices Co., and the new address will be 945-7 South Main street, Los Angeles.

Toledo, O.—A new concern was organized in Toledo this week, to be known as the Ignition Starter Co. It will have quarters in the Nicholas building. H. A. Cavanaugh and J. M. Ewing are the promoters of the business.

Denver, Colo.—The Colorado Automobile Co., Denver agent for the Cadillac, has moved to the new building at Thirteenth and Broadway just being completed by Tom Botterill, the local Pierce, Hudson and Columbus agent, which will house his own establishment as well as that of the Cadillac.

Marinette, Wis.—The United Car and Sales Co. has been organized here by Myron Churchill and Harold Scott, to do a general agency and garage business at 1351 Main street. The concern will represent the Buick and Kesselkar lines. Alex Nordquist will be in charge of the garage and shops.

York, Pa.—The Ford Auto Co., Sanford, Me., has taken the agency for the 1912 line of Pullman cars. M. H. Pletcher, Akron, Ohio, will handle the Pullman 1912 line in Summit county, Ohio. Harry Stout, 12-14 East State street, Trenton, N. J., has added the Pullman car to his line of 1912 models.

Boston, Mass.—Manager Pruden of the New England branch of the Kesselkar Co., has approved plans for a new building to be erected for the company on Commonwealth avenue out in the Fenway section. It will be two stories in height and 200 feet long, giving ample room for salesrooms and a service depot.

Louisville, Ky.—The business of the Ford Motor Co., of Detroit, has been increasing so rapidly in Kentucky through its Louisville agent, the Banks Motor Car Co., that the factory has established a permanent branch here. The manager of the local branch has not yet been selected, but for the present M. A. Enders, of the Cincinnati branch, will look after the Ford business until future plans have been worked out. Louisville will be the headquarters for the entire state with the exception of a small strip of territory in

northern Kentucky, which will continue to be handled from the Cincinnati branch.

North Adams, Mass.—Barber & Hunter have been appointed Franklin dealers for this vicinity.

Des Moines, Ia.—The Brown-Corley-Ellis Co. has secured the Iowa agency for the Lozier. The Brown-Corley-Ellis Co. will move into new quarters within a few weeks.

New York—Henry G. McComb, formerly chief engineer for the E. R. Thomas Motor Co. before its reorganization, has recently resigned as assistant general manager of the Louis J. Bergdoll Motor Co., to join the forces of Wyckoff, Church & Partridge, Inc., New York city, as manager of the

commercial engineering department, with headquarters here.

Fond du Lac, Wis.—The Auto Tire and Repair Co. has been appointed agent for the Rambler line.

Fremont, O.—E. E. Pease has been placed in charge of a new concern which will open a factory for the manufacture of auto tops, to be located on North Arch street.

Boston, Mass.—The Haynes is again represented in Boston, this time by the W. L. Russell Co. This company also has the Regal agency and it had the agency for the Apperson, but this has been given up for the Haynes. The Haynes has been handled by the Hudson-Colby company, but

Mr. Hudson has now gone as branch manager of the Alco here.

Staunton, Va.—H. B. Sproul & Co. have secured the dealership for Franklin cars in this territory.

Milwaukee, Wis.—Bonow Brothers have taken over the Boulevard garage at 266-268-270 Twenty-sixth street and will handle the Nyberg line of cars in Milwaukee county.

Omaha, Neb.—S. A. Zapp and J. F. Lehrmann, of Fremont, have contracted with the Racine-Sattley company to handle the Nyberg and Columbus cars in their territory. The Casey Auto Co., of Casey, Ia., also will handle the Nyberg cars.

New York—G. & S. Accessory Co., capital stock \$100,000; to manufacture and deal in supplies; incorporators, Frank D. Glover, John G. Stuart and John Z. Lowe.

New York—Advance Motor Express Co., capital stock \$50,000; to rent motor cars; incorporators, H. S. DeCamp, H. L. Graft and J. I. Doherty.

New York—Trautman Air Rubber Tube Co., capital stock \$100,000; to manufacture motor car tires; incorporators, I. Trautman, A. V. Denis and W. G. Newhall.

White Plains, N. Y.—William Marshall, Inc., capital stock \$20,000; to manufacture motor vehicles; incorporators, W. Marshall, Marguerite Young and John Hamilton.

New York—Agotaras Garage Co., capital stock \$10,000; general garage business; incorporators, W. R. Hoffman, Leonora Kilinger and John Bahr.

Buffalo, N. Y.—Frontier Tire and Rubber Co., capital stock \$250,000; to manufacture tires; incorporators, G. B. North, H. M. Gill and Franklin Stowe.

Newark, N. J.—North Jersey Motor Vehicle Co., capital stock \$15,000; incorporators, J. B. Stobaens, Jr., W. C. Stobaens and W. H. Weldon, Jr.

Boston, Mass.—Vera Motor Car Co., capital stock \$60,000; incorporators, E. E. Clark, G. M. Poland and M. A. Sweeney.

Baldwin, N. Y.—Baldwin Garage, capital stock \$1,000; directors, C. H. Southard, M. A. Southard and W. C. Southard.

Brooklyn, N. Y.—Clinton Garage, capital stock \$1,000; incorporators, A. M. White, R. L. Pierrepont and E. A. Freshman.

Boston, Mass.—White, Binford & Robinson Motor Co., capital stock \$20,000; incorporators, A. C. White, Jr., A. E. Binford and Cecil P. Robinson.

New York—Trautman Air Rubber Tube Co., capital stock \$100,000; to manufacture tires; incorporators, I. Trautman.

New York—Volkmar Auto Starter Co., capital stock \$20,000; to manufacture starting devices; incorporators, B. Volkmar, E. Giegerich and W. H. Giegerich.

New York—Studebaker Corp. of America, capital stock \$100,000; to manufacture motors; incorporators, L. A. Kuhns.

New York—Bergen Auto Exchange, capital stock \$25,000; to manufacture machinery; incorporators, R. Brown, M. Keve and C. Goldstein.

Sewaren, N. J.—Motor Vehicle and Marine Construction Co., capital stock \$15,000; to manufacture and deal in motor cars; incorporators, H. E. Acker, A. B. Boynton and W. C. Mutt.

New York—Bayles Sales Co., capital stock \$10,000; to manufacture and deal in motor cars; incorporators, H. T. Bayles, H. K. Smith and A. P. Anderson.

Norfolk, Va.—Virginia Automobile Garage and Repair Corp., capital stock \$10,000; president, H. L. Page, and vice-president, A. M. Bopp.

Boston, Mass.—White, Binford and Robinson Motor Co., capital stock \$20,000; incorporators, A. C. White, C. P. Allston and H. O. Cushman.

Chicago—National Spring Tire Co., capital stock \$125,000; to manufacture and deal in motor cars and accessories; incorporators, C. L. Sigman, Jr., L. Valance and C. H. Jackson.

Chicago—Federal Motor Car Co., capital stock \$10,000; to manufacture and deal in motor cars, trucks, etc.; incorporators, C. W. Rhoades, D. F. Rosenthal and L. S. Kositchek.

Newark, N. J.—Newark Auto Accessory Mfg. Co., capital stock \$100,000; incorporators, P. Laible, H. Elsenlohr, S. J. MacDonald and G. H. Hepp.

Recent Incorporations

Richmond, Va.—Fredericksburg Motor Co., Inc., capital stock \$10,000; incorporators, L. R. Colbert, A. T. Embrey and H. C. Biscoe.

Morrisonville, Ill.—General Auto Sales Co., capital stock \$5,000; general motor car and garage business; incorporators, J. E. White, E. C. Luther and T. C. Dodson.

New York—Benford Mfg. Co., to manufacture and sell motor cars; incorporators, G. Brauhurger and E. I. Kleinfeld.

Bradock, Pa.—Miles Motor Tire Spring Co., capital stock \$200,000; incorporators, M. R. Myers, F. B. Miles and C. W. Dressler.

New York—D. S. L. Co., capital stock \$100,000; to operate garage; incorporators, J. C. Leuze, John J. Laine and Paul J. Dubois.

New York—International Horse and Motor Exchange; capital stock \$75,000; to deal in horses, carriages and motor cars; incorporators, W. S. Blitz, C. J. Waters and L. M. Qualey.

New York—Cavac Motor Car Co., capital stock \$500,000.

New York—Chestertown Auto & Garage Co., capital stock \$25,000.

Southampton, N. Y.—Walter Motor Truck Co., capital stock \$100,000; to manufacture and repair motor cars; incorporators, W. Wilter, E. W. Walter and C. W. Fletcher.

Mt. Vernon, N. Y.—Meteor Automobile Co., capital stock \$50,000; to manufacture motors; incorporators, F. A. Kateley, A. F. Goldschelt and J. Emmeluth.

Buffalo, N. Y.—Czar Ignition Co., capital stock \$12,000; to manufacture ignition apparatus for gasoline engines; incorporators, H. V. Bisgood, Jr., W. F. White and R. A. Huessler.

Camden, N. J.—Suburban Truck Co., capital stock \$10,000; to manufacture motor cars; incorporators, J. E. Fagan, G. H. Jacobs, W. R. Carroll.

Newark, N. J.—Suspended Pneumatic Tire Co., capital stock \$500,000; incorporators, J. Williamson.

Ridge, N. J.—Stark Auto Co., capital stock \$100,000; to manufacture and deal in motor cars; incorporators, J. H. Stark, H. S. Stark, R. A. Sibbald and F. O. Mittage.

New York—Advance Motor Express Co., capital stock \$50,000; to rent motor cars; incorporators, H. S. DeCamp, H. L. Craft and J. J. Doherty.

Worcester, Mass.—Acme Motor Car Co., capital stock \$40,000; to deal in motor cars; incorporators, A. D. Waterson and W. C. Foley.

Indianapolis, Ind.—Motor Starting Co., capital stock \$1,000,000.

Cincinnati, O.—Fischer Auto and Service Co., capital stock \$60,000; incorporators, A. G. Fischer.

Columbia, S. C.—Consolidated Auto Co., capital stock \$5,000; incorporators, J. B. Roddey, W. W. Pearce, J. P. Matthews and J. J. Cain.

Dallas, Tex.—Indiana Motor Car Co., capital stock \$10,000.

Los Angeles, Cal.—Sky-Pilot Motor Co., capital stock \$10,000; directors, G. Bentley, E. M. Fisk, S. W. Odell, E. T. Banning and C. B. Sheldon.

Taunton, Mass.—Perry Auto Co., capital stock \$3,000; directors, H. L. Lane, F. W. Perry and J. B. Wetherell.

Charleston, W. Va.—Kanawha Auto Truck Co., capital stock \$50,000; incorporators, W. S. Roberts, G. F. Gates and others.

New Haven, Conn.—Pyramid Automobile Co., capital stock \$5,000; incorporators, W. H. Goodrich and H. P. Johnson.

New York—Mechanics Motor Car Co., capital stock \$10,000; to manufacture and deal in motor vehicles; incorporators, P. Kuehn and G. L. Gast.

Ashboro, N. C.—Ashboro Motor Car Co., capital stock \$5,000; incorporators, M. L. Davis, C. Rush and I. N. Cox.

Greensboro, N. C.—Greensboro Motor Car Co., capital stock \$25,000; incorporators, H. M. Chamblee, W. M. Fowler and W. M. Sherrod.

Tulsa, Okla.—Southwestern Auto Co., capital stock \$1,000; incorporators, J. D. Gibby, Carl C. Magee and H. Hancock.

Toledo, O.—Mallory Transportation and Storage Co., capital stock \$150,000.

Rome, Ga.—Seay-McCartha Automobile and Garage Co., capital stock \$3,000; incorporators, S. R. McCartha, R. M. McCartha and J. J. Seay.

Chicago—Co-Operative Auto Supply Co., capital stock \$2,500; general supplies; incorporators, J. C. Paul, J. Moore and L. W. Plummer.

New York—International Motor Service Co., capital stock \$100,000; to manufacture motor cars; incorporators, W. H. Brearley, W. W. Friend and others.

St. Louis, Mo.—Curtis Jack & Truck Co., capital stock \$75,000; incorporators, J. R. Curtis, H. C. Flunker, A. W. Smith, O. Stiver and G. E. Booth.

Shreveport, La.—F. W. Palls Automobile and Machinery Co., capital stock \$10,000; incorporators, R. E. Allison, J. T. Allison, W. T. Moore and F. W. Palls.

Paris, Ill.—Paris Auto Starter Co., capital stock \$10,000; incorporators, F. C. Fishback, E. B. Brooks and others.

Schenectady, N. Y.—S. R. Mfg. Co., capital stock \$50,000; to manufacture motors; incorporators, C. Steenstrup, K. M. Rossi and R. J. Ury.

Norwalk, Conn.—Reynolds Motor Car Co., capital stock \$4,000; incorporators, F. Reynolds and W. L. Oaken.

St. Louis, Mo.—Mack Motor Truck Co., capital stock \$25,000; incorporators, W. R. Bush, F. J. Bush, K. Taussig, T. S. McPheeters and W. A. Thomas.

Bloomfield, N. J.—Torbenson Gear and Axel Co., capital stock \$120,000; incorporators, J. O. Eaton and H. O. Trube.

St. Louis, Mo.—Schelp-Budke Tire and Rubber Co., capital stock \$10,000; incorporators, C. Budke, C. M. Schelp, W. R. Schelp, G. H. Schelp and H. A. Krueger.

Gastonia, Va.—Gastonia Garage Co., capital stock \$50,000; incorporators, A. G. Myers, John C. Rankin, W. H. Adams and others.

Birmingham, Ala.—Auto Tire and Cycle Co., capital stock \$2,000; R. Stansel, president.

Buffalo, N. Y.—Frontier Specialty Co., capital stock \$30,000; directors, W. F. White, H. V. Bisgood, Jr., R. A. Heussler and T. W. Morris.

Pittsburgh, Pa.—Large Motor Truck Co., capital stock \$25,000; to manufacture motor cars.

Manhattan, N. Y.—G. & S. Accessory Co., capital stock \$100,000; to deal in supplies; incorporators, F. D. Glover, J. G. Stuart and J. Z. Lowe, Jr.

Portland, Mass.—Hamlin Foster Auto Co., capital stock \$100,000; promoters, A. D. Hamlin, J. L. Foster and others.

Marion, Ind.—Auto Machine Co., capital stock \$10,000; to operate machine shop; directors, G. D. Lindsay, B. A. Tong and R. E. Breed.

Jefferson, N. Y.—Francis Motor Sales Co., capital stock \$5,000; directors, G. M. Francis, R. Hubbell and C. E. Nichols.



Legal Lights and Side Lights

JERSEY WANTS NEW LAW

NEW JERSEY motorists are now a unit in favor of a new, moderate, sensible motor law. The recent election changed the complexion of the legislature of New Jersey to such an extent that much hope for better things is springing up in the hearts of the motor fraternity.

As an indication of concerted action and solid ranks among the motorists the fact has become known that the New Jersey Automobile and Motor Club, the giant organization that split away from the American Automobile Association and the Associated Automobile Club of New Jersey last year, has made advances to the Associated clubs and the New Jersey Automobile Trade Association to join hands with it in drafting a new law for presentation to the coming session of the legislature.

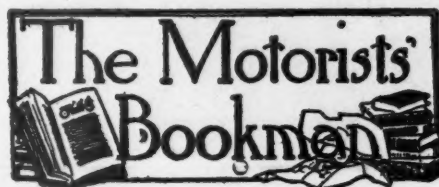
With this idea in view the New Jersey club, the Associated clubs and the Trade association have formed a committee of fifteen, five from each organization, and empowered the committee to act. The committee has been instructed to draw up a bill repealing the noxious power-of-attorney clause in the present law, by which visiting motorists are obliged to sign instruments empowering the secretary of state of New Jersey to accept service for them in case of alleged infringements of the motor vehicle law. The bill will also be framed to provide for a reasonable exemption of visitors.

The measure advocated by the trade body and the association of clubs, which was built on the lines suggested above, was defeated by a single vote in the upper house after being passed by the assembly. The composition of the senate remains almost the same as it was before but the assembly has been radically changed.

FAVORS CHANGE IN MARYLAND

Commissioner of Motor Vehicles John E. George has made several recommendations for changes in the motor vehicle law which have not proved pleasing to the motorists of the state. He will place his recommendations, however, before the new legislature, which meets in January. He wants operators of motor cars to renew their licenses each year at a cost of \$2. At present there are 9,469 operators of motor cars throughout the state, and some of these licenses date back 5 years. This shows what an increase would be derived by the state through the commissioner's proposed plan. He also wants the graded car license fee, and his idea is something like this: At present a car of 30 to 40 horsepower, for instance, licensed in Janu-

ary of each year, costs \$12 a year. In February it costs \$11, and so on, a dollar being deducted each month until the end of the year. Under Mr. George's proposed amendment the cost would be \$12 for a license issued up to July 1 of any year, after which it would cost \$6 if issued during any other month. Comparing this



Surface Japan

ONE of the most beautifully illustrated books of the season is "Surface Japan," by Don C. Seitz, which creates at once a favorable impression of its contents. It is written by one who, though making a brief or surface visit through Japan, is a trained observer and saw the country at its best, its culture and quaintness, its hospitality and its seriousness. The author says the "efforts of the Japanese to create a good impression upon foreigners begins at the customs house. Here the celebrated smile makes itself officially visible. A Welcome Society's pamphlet announces that visitors will be treated with all possible consideration consistent with the observance of the land," which proves to be true. The customs of the country and some of its leading cities are interestingly described, giving much information on the old and New Japan. The "tipped-in" colored illustrations of Japanese scenes, its broad margins and typical marginal sketches make a particularly attractive holiday book for the would-be traveler. Harper & Brothers, New York. Price \$1.60.

Set in Silver

This book of a motor tour by C. N. and A. M. Williamson in the British Isles is written as a series of letters, which are woven together by a love plot. Although published some 2 years ago—but not previously reviewed in these columns—the book will undoubtedly appeal to those who may be planning a foreign tour for next summer, it being written in the inimitable Williamson style. The tour, beginning in London, skirts the shore of the isles. Doubleday, Page & Co.

The Heart of a Woman

This is a story of love and tragedy in the upper middle class of England and hinges on a murder in a taxicab. It is decidedly of the trashy, dime-novel type of story written by Baroness Orczy. Published by George H. Doran Co.

with the present month, the cost now, under the existing law, would be \$2 until the end of the year, while under Mr. George's plan it would be \$6. Cars of other horsepower would be taxed in proportion to this plan. This, of course, would mean more money out of the pockets of motorists, and they do not admire the proposed new scheme.

FINE POINT OF LAW

A lesson to motorists who fall into the hands of ambitious country constables is taught in an opinion handed down last week by President Judge George Kunkel, of Dauphin county, Pa. The court overrules an appeal from summary conviction made by a motorist who was arrested and fined in Middletown for the failure to blow his horn at a street crossing.

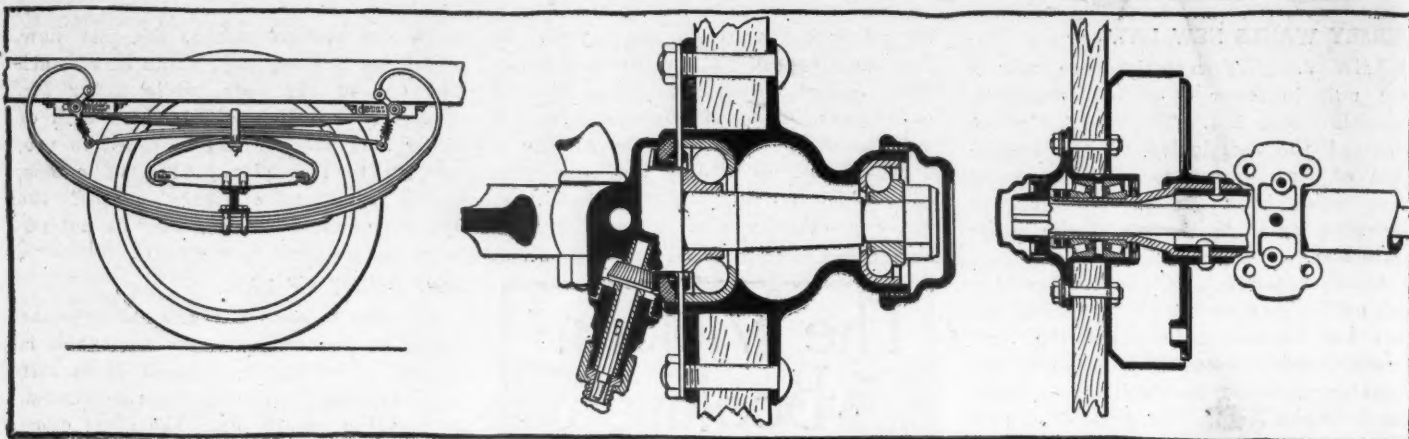
May 8 last John W. Gerlock, lumber dealer, of Highspire, was arrested by Constable George H. Zeigler, a Middletown constable, for failure to blow his horn on approaching a street crossing. There was a sign at the crossing: "Danger, Blow Your Horn!" in 5½-inch letters. Taken before George W. Rodfong, he was tried and found guilty. Then he appealed to the county court, claiming that he had a right to trial by jury.

"The accused must elect between a trial before the justice and by a jury in court, but he cannot appeal after submitting to a trial before the justice," the court's opinion reads. "The appeal is dismissed."

DOUBLE PENALTY POSSIBLE

An interesting question has arisen in Wisconsin to the effect of city ordinances adopted by municipalities to conform with the state laws covering certain cases, such as violation of speed laws, stopping after accidents, etc. The question is, Can a person who violates a state law which is supplemented by a city ordinance be punished doubly, once under each statute? The attorney general says a double penalty could be imposed and numerous district attorneys say that a prosecution under the state law would not bar further prosecution under the city ordinance. In digesting the various opinions, it is found that the only hope of a motorist unfortunate enough to be convicted of violating a state law and city ordinance at one and the same time has only one hope of escaping dire penalties, and that is that it is not customary to prosecute under both laws for the same act. As fines for violation of the state laws go into the state treasury and fines for violation of an ordinance go into the city treasury, some enterprising cities in Wisconsin find the way open to do a good business in double prosecutions.

Current Motor Car Patents



NICE VEHICLE SPRING

ADAMS SPEEDOMETER MECHANISM

ALDEN DRIVING AXLE

ADAMS Speedometer Driving Mechanism—No. 1,007,625, dated October 31, to Thomas Edgar Adams, Cleveland, O.—This patent relates to a driving mechanism for speedometers which is incorporated in the steering spindle of a front axle as illustrated herewith. It is a combination of a wheel hub and an axle spindle having an enlargement, of a gear ring secured to the hub, a circular member carried by the spindle and receiving the gear ring thereinto, a shaft mounted in the enlargement of the spindle, a pinion secured to the shaft, and meshing with the gear ring, and a flexible shaft connected with the first mentioned shaft for transmitting motion to the speedometer.

Alden Driving Axle — No. 1,007,260, dated October 31; to Herbert W. Alden, Detroit, Mich.—This patent pertains to a combination with tubular axle of a driving shaft rotatably mounted therein, the wheel hub rotatably mounted on the end portion of the axle and comprising a barrel portion having at its outer end an annular flange wide enough to constitute a spoke clamping plate, a brake drum plate, spokes between the flange and the brake drum plate, a driving plate abutting platewise against the flange and having interlocking engagement with the driving shaft, and bolts threaded at both ends and provided with collars, these bolts extending through the brake drum plate, the flange and the driving plate being counter bored

to receive the collars and a washer surrounding the shaft between the driving plate and the end portion of the hollow axle.

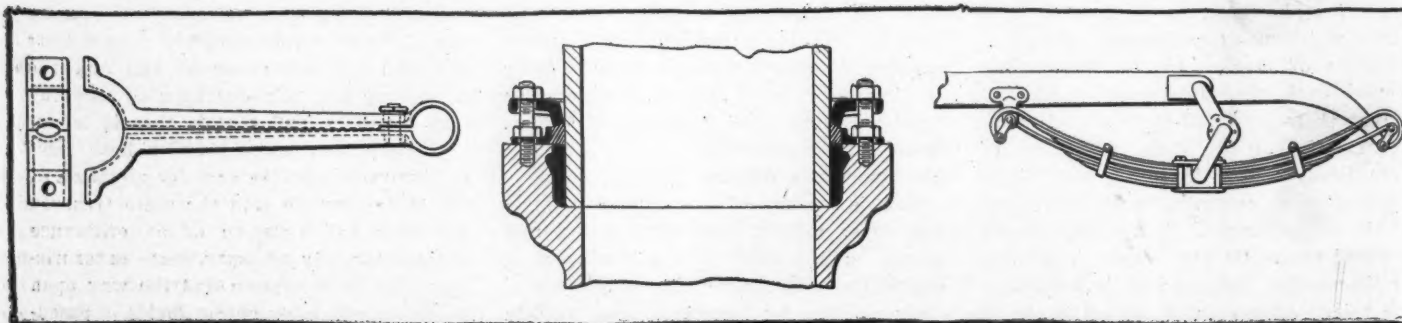
Schiller Shock Absorber—No. 1,006,686, dated October 24; to William A. Schiller, Goodison, Mich.—The shock absorber to which this patent relates is a combination with a vehicle frame and a spring therefor, provided at one end with an air inlet valve and escape ports, a closure for the other end of the cylinder, this inclosure having an extending arm the free end of which terminates in a lateral extension journaled in the frame, a spring-held piston slidable in the cylinder, a plunger plate mounted against rotation in the cylinder and slidable therein, one end of the plunger bearing against the piston, a disk-shaped cam member rotably mounted on the cylinder and having wedged cams adapted to engage with the free end of the plunger plate and actuate it when the cam member is rotated, and means connecting the cam member with the spring of the frame, this means being adapted to rotate the cam member when the frame spring is distorted.

Lord Pipe Clamping Device—No. 1,006,490, dated October 24; to Raymond S. Lord, Pittsburgh, Pa.—This patent covers a clamping device for pipe joints comprising bell and spigot members of a main packing between the walls of the members, a ring member contiguous to the end

face of the bell end and provided with an annular face disposed oppositely to the outer wall of the spigot member, a packing ring interposed between the oppositely disposed wall of the ring member and pipe section, and a means for forcing the packing ring home between the two opposing walls.

Coppock Steel Connecting Rod—No. 1,006,632, dated October 24; to Lembert W. Coppock, Decatur, Ind.—This patent pertains to a pressed steel connecting rod for engines, consisting of a central body portion formed by two longitudinal parts welded together, an eye at one end formed by centrally bending the material constituting the connecting rod and the other end of each welded half of the connecting rod spread in the arc of a circle, a semi-circular member, having a tongue punched out of it centrally, means for securing this member to the bifurcated end of the connecting rod.

Nice Vehicle Spring—No. 1,007,479, dated October 31, to Frederick J. Nice, Pontiac, Mich.—This patent covers a vehicle spring in combination with a wheel axle and a vehicle body, a pair of plate spring members located in supporting position with respect to the vehicle body, spring members yieldingly linking the ends of the plate spring members to one another, a pair of arch springs whereby their position with respect to the other members is controlled.



COPPOCK CONNECTING ROD

PIPE CLAMP

SCHILLER SHOCK ABSORBER